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DISEASES CAUSED BY BACTERIA AND FUNGI.

PLUM, N. (1936). **Human Tuberculosis in Cattle.**—*Skand. VetTidskr.* **26.** 645-667. 5 tables. [9 refs.] [In English: Swedish summary].

P. first of all refers to an experiment described in a previous paper [*V. B.* **5.** 686.] in which five cattle became infected when fed on expectorate from persons with " open " bovine type pulmonary tuberculosis. In this paper the possibility of cattle becoming sensitized to tuberculin, through contact with " open" human tuberculosis, is discussed and several cases of natural infection are described which are certainly very suggestive. Details are also given of an experiment in which three cows and four calves were fed on human expectorate. In the cases in which there had been natural exposure to infection many cattle became sensitive to intradermal tuberculin tests, but were free from lesions at *post-mortem* examination. Following the feeding experiments, all except one cow reacted to the intradermal test, but only the calves reacted to the subcutaneous test. Except in one calf no macroscopic tuberculous lesions were found at *post-mortem* examination.

P. failed to demonstrate the excretion of tubercle bacilli in the milk of cows which reacted to avian tuberculin and also in those naturally exposed to or fed with human tubercle bacilli. [He presumably implies that these cows were non-reactors to tuberculin prepared from mammalian types of bacilli].—G. O. DAVIES.

SCHMIDT-LANGE, W. (1935). Untersuchungen an Meerschweinchen über den Einfluss des Hungerns auf den Verlauf der Tuberkulose. [**The Effect of Hunger on the Development of Tuberculosis in Guinea Pigs**].—*Arch. Hyg., Berl.* **115.** 9-37. 10 tables. [Numerous refs.]

The author carried out experiments in order to determine the effect of an inadequate amount of food on the course of tuberculosis in artificially infected g. pigs. The animals were divided into two groups, one receiving 15 g. of hay and 60 g. of roots daily, whilst the second group, receiving double these quantities, acted as a control group. In the underfed group the course of the disease was more severe than in the other. As there is great individual variation in the reaction to infection, large numbers of animals were used in order to obtain a significant result. Other factors in the underfed animals, such as excitement and exertion expended in search of food, complicated the picture.

The author concluded that hunger *per se* has but a slight adverse influence on the development of the disease.—N. J. SCORGIE.

—. (1936). [Papers by LAMONT, H. G., CRAIG, J. F., MATTHEWS, H. T., & MATTINSON, A. B., with General Discussion]. **Discussion on the Report of the Northern Ireland Experiments with the Spahlinger Vaccine.**—*Vet. Rec.* **48.** 675-681. [See also *V. B.* **6.** 395].

In opening the discussion Lamont described the origin of the experiment and explained the preparation of the vaccine. He also briefly reviewed the main points in the report and referred to the various criticisms which had already been made.

Continuing the discussion, Craig compared Spahlinger's vaccine with the BCG and diaplyte vaccines. He agreed that the Spahlinger vaccine seemed to confer a certain degree of protection and was worthy of further investigation. He expressed the hope, however, that in future tests a larger number of animals would be used and that they would only be divided into two groups, namely, vaccinated and control groups.

Matthews expressed disappointment with the arrangement of the experiment and doubted its value. If it was to be repeated, he hoped that the research workers would have complete control of the design and conduct of the experiments.

Mattinson and Mayall referred to the shortcomings of the report, but took a more tolerant view of the difficulties. Webster considered that the investigation was of academic interest only and that it could be of little value from a practical point of view. Downham thought that there was " something in " the Spahlinger vaccine and Davies considered that Lamont's explanations had certainly added to the value of the report.—GWILYM O. DAVIES.

DUNKIN, G. W. (1936). **Paratuberculosis of Cattle and Sheep.**—*Proc. R. Soc. Med.* **30.** 83-90. [Numerous refs.]

A good summary of the present state of our knowledge with regard to Johne's disease.—A. ROBERTSON.

GIRARD, G. (1936). Le porc peut-il être un porteur sain de bacille de Whitmore. [**The Pig as Carrier of** *Pfeifferella whitmori*].—*Bull. Soc. Path. exot.* **29.** 712-716. [3 refs.]

In Madagascar, haemorrhagic lymph nodes were noted in many pigs examined at the abattoirs. A g. pig inoculated with a suspension of a node developed acute symptoms and died seven days later. The spleen was greatly enlarged. After serial passage through g. pigs an organism corresponding in cultural characters to *Pf. whitmori* was isolated. The origin of the infection is obscure as melioidosis has never been found in Madagascar, but G. considers that a careful watch should be maintained for evidence of its existence.—C. McG.

I. SZÁSZ, A. (1935). Adatok a baromfikolera járványtanához. [**Contributions to the Epidemiology of Fowl Cholera**].—*Allatorv. Lapok.* **58.** 87-91. [3 refs.]

II. MANNINGER, R. (1935). Megjegyzések Dr. Szász Alfred " Adatok a baromfikolera járványtanához " cimen az Á. L. 1935. 6. számában megjelent cikkéhez. [**Remarks on the Article by Dr A. Szász " Contributions to the Epidemiology of Fowl Cholera " Published in** *Allatorv. Lapok.* **58.** 87-91]. —*Ibid.* 105-106. [3 refs.]

I. S. briefly discusses the significance of predisposing factors in the incidence of fowl cholera, and concludes that there are outbreaks which apparently cannot be explained solely on the basis of the " disposition theory ". In his opinion, the fowl cholera bacillus has a fixed pathogenicity which it may keep for a long

time in various media, such as soil, water, mud, manure and other substances. In appropriate circumstances these media transmit the infection and cause outbreaks of fowl cholera. It is further suggested that the spread of the infection takes place through the mating of infected cocks, the testes of which harbour the bacilli in great numbers.

II. In his remarks on the above article M. expresses doubt as to whether the bacillus of fowl cholera will live in the above-mentioned substances for a long time, and whether the testes of mating cocks harbour fowl cholera bacilli, present knowledge on the pathogenesis of this disease not being in harmony with the statements of Szász.—A. Kotlán (Budapest).

I. Edwards, P. R. (1936). **Fermentative Varieties of Salmonella aertrycke.** —*J. infect. Dis.* **58.** 225-229. 1 table. [11 refs.]

II. Burrows, W., & Jordan, E. O. (1936). **Oxidation-Reduction Potentials in Salmonella Cultures. II. Characteristic Potentials produced by Members of the Suipestifer and Enteritidis Groups.**—*Ibid.* 259-262. 2 figs. [2 refs.] [See also *V. B.* **5.** 792].

III. Edwards, P. R. (1936). **Serological Variants of** *Salmonella typhi-murium* **with Special Reference to** *S. typhi-murium* **var.** *Binns.*—*J. Hyg., Camb.* **36.** 348-354. [12 refs.]

I. Cultures of *S. typhi-murium* (*Bact. aertrycke*) from different outbreaks of disease in a variety of animals were divided into types according to their rate of action on various fermentable substances. By using xylose, rhamnose, or maltose as a substitute in the rhamnose test of Bitter, Weigmann and Habs [(1926). *Münch. med. Wschr.* **73.** 940.] it was possible to separate the cultures from seven different outbreaks of disease into four groups and the groups coincided with the sources of the cultures. The method is, therefore, considered to be of value in determining the source of an epidemic.

II. It has been shown previously that the oxidation-reduction potentials developed in cultures of certain bacteria of the salmonella group differed within the group but were correlated with the bacterial type. The characteristic oxidation-reduction potentials of *S. paratyphi* C, *S. cholerae-suis* var. *Kunzendorf* and *S. sendai* are recorded. *S. paratyphi* C and *S. cholerae-suis* var. *Kunzendorf* are indistinguishable in potential characteristics ; there is, however, a marked difference as compared with *S. cholerae-suis* (American diphasic type of *Bact. suipestifer*). This cannot as yet be explained, for all three are closely allied serologically. The former two produce H_2S, and there is a suggestion that this may be significant, but tests with strains of *S. pullorum* do not substantiate this. [The authors state that this latter organism does not produce H_2S, whereas Tittsler – (1931). *J. Bact.* **21.** 11. – showed that, if grown at 30°C., the majority do so]. There is a marked difference between the characteristic potentials of *S. sendai* and *S. paratyphi* A, which share a common " H " antigenic factor, and between *S. sendai* and strains of *S. enteritidis*, which share a common " O " antigenic factor.

It therefore appears that no single metabolic or antigenic factor determines the potential level.

III. Largely owing to the work of White, the cultures of salmonella known as the Binns type have been accepted as non-specific variants of *S. typhi-murium*, with an antigenic formula as follows : IV, V : – : 1, 2, 3, that is, differing from *S. typhi-murium* by the lack of specific (type) " H " components.

Several cultures of the above type have been re-examined and shown to contain specific " H " components characteristic of *S. typhi-murium*, but to lack the " O " somatic factor V. The author proposes to amend the formula as follows :–

from IV, V : – : 1, 2, 3, to IV : i : 1, 2, 3. This formula is identical with that for strains hitherto described by KAUFFMANN as *S. typhi-murium* var. *Copenhagen*, and by EDWARDS as *S. aertrycke* var. *Storrs*. These organisms should, therefore, be known as *S. typhi-murium* var. *Binns*.—R. LOVELL.

I. LESBOUYRIES, M., & BERTHELON. (1936). Salmonellose des palmipedes. **[Salmonella Infection in Palmipeds]**.—*Rec. Méd. vét.* **112.** 193-209. 2 tables.

II. JOHNSON, E. P., & ANDERSON, G. W. (1936). **Pullorum Disease in Turkeys.** —*J. infect. Dis.* **58.** 337-341. [5 refs.]

III. LEE, C. D., HOLM, G., & MURRAY, C. (1936). **Paratyphoid Infection in Turkeys.**—*J. Amer. vet. med. Ass.* **89.** 65-76. 2 tables. [5 refs.]

I. The first part of this article contains a history of the salmonella group of organisms, with special reference to the members of this group which are of interest to veterinarians. Tables are given showing the reactions of the various members of the group in carbohydrate media and their differentiation by means of serological tests. Apart from *S. pullorum* and *S. gallinarum*, which are innocuous to man, despite the consumption of large numbers of infected eggs, all the other salmonella affecting fowls are pathogenic to man, causing fatal, acute gastro-enteritis through the ingestion of infected eggs and flesh.

The second part of the paper deals with salmonellosis in ducks and geese. The organisms most commonly involved in outbreaks are *S. enteritidis*, *S. typhi-murium*, and *S. anatum*. The disease may be acute or subacute and mortality may be as high as from 90% to 95%. Outbreaks occur in ducks and geese during the first ten days of life, and death usually follows in several hours. The disease is not so common in adults, in which it is less acute and less fatal.

The symptoms, *post-mortem* and bacteriological findings, treatment and prophylaxis are discussed. The agglutination test is of value for the detection of adult carriers. During an outbreak, vaccination of healthy birds with a killed vaccine appears to give good results.

II. J. and A. report two extensive outbreaks of *S. pullorum* infection in turkey poults, in which the infection appears to have been transmitted through the eggs of affected female birds. No information could be obtained to explain the source of the infection. Agglutination tests made on these two flocks and on other flocks were considered to indicate that only turkeys whose serum shows a titre of above 1 : 50 should be regarded as carriers of *S. pullorum* infection.

III. A record of a highly infectious disease, with a high mortality, in turkey poults under five weeks of age, an organism being isolated which was identified as *S. typhi-murium*. It was shown to be highly virulent for chicks, poults, g. pigs and rabbits, when administered (orally, intraperit. or intraven.). The symptoms, the *post-mortem* lesions, and the characteristics of the organism isolated are described.—R. F. GORDON.

I. MALLMANN, W. L., & MOORE, J. M. (1936). **Studies of Pullorum Disease II. The Incidence of Salmonella pullorum in Eggs from Infected Hens.**—*J. Amer. vet. med. Ass.* **89.** 35-52. 1 fig., 11 tables. [16 refs.] [See also *V. B.* **5.** 409].

II. MCCULLOCH, E. C., & COSTIGAN, Stella. (1936). **The Resistance of Salmonella pullorum to the Action of Various Disinfectants.**—*Ibid.* 53-58. 7 tables. [2 refs.]

I. The data presented show that the incidence of *S. pullorum* is far less in the infertile eggs from reacting hens than in the fertile eggs from the same hens ;

while there is a much higher incidence in both dead germs and chicks dead in shell than in the live chicks from the same hens. With the high incidence of *S. pullorum* in the eggs of reactor hens it is interesting to note the small number of chicks found to be infected. The extent of pullorum disease in chicks is probably due, not to the large number of congenitally affected chicks, but to the highly contagious nature of the disease, and to the spread from a few infected chicks during hatching and brooding.

II. A record of experiments carried out to show the germicidal efficiency of some of the most widely used disinfectants against *S. pullorum*, when used in the presence of organic matter (chicken manure) and at varying temperatures.

Tables are given showing the recommended dilutions of various disinfectants at different temperatures.—R. F. GORDON.

I. EDGINGTON, B. H. (1936). **A Study of the Effect of** *Brucella abortus* **in Udderless Cows.**—*J. agric. Res.* **53.** 225-233. 2 tables. [Numerous refs.]

II. ANON. (1936). **Progress in Bang's Disease Project.**—*J. Amer. vet. med. Ass.* **89.** 379-380. 1 chart.

III. ANON. (1936). **Report of the Special Committee on Bang's Disease.**—*Ibid.* 456-458.

IV. FITCH, C. P., & THOMPSON, Charlotte M. (1936). **Studies of Physical Properties and Agglutinability of** *Br. abortus* **Plate Antigens from Several Sources.**—*Cornell Vet.* **26.** 222-230. 7 tables. [4 refs.]

I. In an attempt to ascertain whether cows free from infection of the udder can disseminate *Br. abortus* during subsequent pregnancies, six heifers, from which the udders had been removed by surgical operation, were infected (3 *via* the vagina and 3 *via* the conjunctiva) with a bovine strain of *Br. abortus*. All aborted and the organism was recovered in four cases from the foetal material.

At the second pregnancy all calved normally and *Br. abortus* could not be isolated from the vaginal material, nor were any of eight susceptible pregnant heifers infected, although they were kept in close association with the experimental animals. Records of agglutination titres are given.

II. Figures released by the Bureau of Animal Industry show that, in the states located in the Middle West, the effect of the four tests now made under the co-operative plan has been to reduce the number of herds infected from 2,801 to 692, while the number of infected animals has been reduced from 26·7 % of 72,448 to 2·7 % of 59,228.

III. It has been shown that in many cases, where the disease is inactive and the proportion of infected animals small, herds can be freed from infection at a small cost by agglutination testing and the slaughter of reactors.

In herds in which the disease is rampant, the immediate financial loss, using this method, is high, particularly in herds containing pedigree stock, while the necessity of introducing purchased animals to replace the slaughtered stock is a great obstacle to success. There is a need for an effective immunizing agent to supplement segregation, and vaccination studies, particularly in calves, are in process.

Recommendations include the continuation of co-operative segregation and the standardization of the increasingly popular " plate " method of agglutination testing.

IV. A comparison of 13 antigens, as supplied for use in the rapid agglutination test, showed that they differed widely in bacterial concentration and viscosity, while only two were of the same shade of colour. Variation in surface tension was slight.

These antigens were used to test 36 sera, which by the test tube agglutination test had been classified as follows :– 14 negative, 18 suspicious, and 4 positive. The results varied from one antigen which gave 35 —, 1 ± and 0 +, to another which gave 3 —, 4 ± and 29 +.

Two " slow " type sera, classified as positive by the test tube method, did not reach the maximum agglutination in some cases until 30 minutes after mixing, while seven antigens gave one, or both sera, as negative. An appeal is made for standardization.—H. H. HOLMAN.

I. FABRE, G. (1936). Expérimentation de la prémunition contre la brucellose bovine, à l'aide du vaccin vivant de Ch. Dubois, préparé avec un excipient gras. [**Premunition against Brucella Infection of Cattle with Dubois' Live Vaccine in a Fatty Base**].—*C. R. Soc. Biol. Paris.* **121.** 1138-1141. [1 ref.]

II. VELU, H., ZOTTNER, G., & SARTHOU, C. (1936). *Brucella abortus* en excipient gras ; variation du taux des agglutinines ; vaccination. [**Vaccination with *Br. abortus* in a Fatty Base ; Variation in Agglutinating Power**]. —*Ibid.* 1041-1043. [4 refs.]

III. VELU, H., & ZOTTNER, G. (1936). Quelques considérations sur la vaccination préventive contre les brucelloses en excipient gras et l'hygiène publique. [**Preventive Vaccination against Brucella Infections with Live Vaccine in a Fatty Base**].—*Bull. Acad. Méd. Paris.* **115.** 551-552. [3 refs.]

I. F. used Dubois' vaccine on 452 cattle, which were either affected or had been exposed to infection. Nearly half of the animals were from two to eight and a half months pregnant at the time of vaccination. Before injection over 50% of the affected animals had aborted. After vaccination only two abortions occurred, and the vaccine did not produce abortion even in the animals far advanced in pregnancy. The duration of immunity has not yet been determined.

II. Horses were inoculated primarily with heat-killed cultures of *Br. abortus*, incorporated in a mixture of lanolin and liquid paraffin. The first injection produced a thermal, general and local response, and the agglutination titre reached 1 : 20,000. Subsequent injections with dead cultures in the same medium produced no general reaction and much smaller local reactions.

The agglutination titre either fell to under 1 : 500 or disappeared completely and, when present, lasted up to 30 days. When living cultures in the same medium were injected later, although a hot, painful, local reaction occurred, the agglutination titre reached 1 : 2,000 and lasted for only 20 days. After the second injection of living cultures the resultant local reaction was less, and the agglutination titre fell to 1 : 500, and disappeared in eight days.

III. V. and Z. are perturbed regarding the conditions which will arise when large numbers of animals are vaccinated against brucella infection with live vaccines in a fatty base, since animals so inoculated cannot be distinguished serologically from naturally infected animals. A local reaction to the vaccine may persist for over 15 months. They suggest that it will not be possible to apply to animals vaccinated against brucella infection the recommendation, which GUÈRIN made in connexion with the identification of animals vaccinated with BCG (ear marking).
—P. L. S.

BER, A. (1936). Badanie krwi i cieploty wewnętrznej u świnek morskich i królików zakażonych paleczką Banga. Doniesienie. II. Wplyw usunięcia śledziony na obraz krwi u świnek morskich, królików i szczurów bialych. [**The Investigation of Blood and Temperature in Laboratory Animals Infected with Brucella. II. Effect of Splenectomy on the Blood Picture in**

Laboratory Animals].—*Wiad. weteryn.* **15.** 278-293. 4 tables. [Numerous refs.] [French summary]. [See also *V. B.* **5.** 475].

Some animals were infected with brucella before splenectomy and some after. A transitory increase in the number of young forms of red blood corpuscles was observed in g. pigs after splenectomy. Twenty-four hours after the operation an increase of granulocytes and a decrease of monocytes were observed. In from 7 to 21 days the numbers of granulocytes decreased and those of the monocytes increased. There was also observed an enlargement of all lymph nodes. In rabbits, after splenectomy, there was an increase in the numbers of granulocytes and a transitory decrease in the numbers of monocytes. In white rats there was transitory normoblastaemia, and an increase in the numbers of granulocytes and monocytes.—A. Szwabowicz (Lwów).

Lange, F. (1936). Beitrag zur Frage der Uebertragung der Bangschen Krankheit. [**The Mode of Infection in Undulant Fever Due to** *Br. abortus*].—*Dtsch. med. Wschr.* **62.** 887-888. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 696. Signed G. S. Wilson].

A case of undulant fever is described in a 9-year-old boy. Infection is supposed to have been acquired from a bitch, one of whose puppies gave an agglutination reaction to *Br. abortus* in a titre of 1/3,000 three days after birth. The bitch herself could not be examined as she died after parturition, but she is said to have suffered from a pustular eruption. It is suggested that sporadic cases of undulant fever may not infrequently be due to infection from animals, particularly dogs. [The evidence of infection from the bitch is in this case quite inconclusive. The boy is said to have drunk milk always in the raw condition. The milk itself was apparently not examined for *Br. abortus*, nor was the herd that supplied it investigated.]

Merliac, L., & Lisbonne, M. (1936). Un cas de fièvre ondulante d'origine bovine. Danger pour l'homme de la prémunition animale par les vaccins vivants. [**A Case of Undulant Fever of Bovine Origin. Danger for Human Beings of Prophylactic Inoculation of Animals with Living Vaccines**].—*Bull. Acad. Méd. Paris.* **115.** 572-575. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 633. Signed G. S. Wilson].

A case of undulant fever is described in a woman. Blood culture 2½ months after the onset yielded a strain of *Br. abortus* that failed to produce H_2S. The case occurred in the Dordogne where undulant fever does not yet appear to have been recognized. The patient had not left home for several years. She possessed one cow which she milked herself. From the cow's blood a strain of *Br. abortus* was isolated that did not produce H_2S. The cow had not aborted, but had been inoculated some time previously with a living Brucella vaccine. Examination of a sample of the same brand of vaccine yielded a culture of *Br. abortus* that failed to produce H_2S. Thus all three strains resembled each other in failing to produce H_2S. The inference is that the patient had become infected from the cow with the same strain as that used for vaccination. Since she invariably boiled the milk, infection had probably occurred by contact. The authors emphasize the danger for human beings of the use of living vaccines for the inoculation of animals. Incidentally they mention that a number of veterinary practitioners have infected themselves accidentally while administering the vaccine.

Robinson, E. M. (1936). **Bloedpens.**—*Fmg S. Afr.* **11.** 257.

Bloedpens or lamb dysentery causes heavy losses to sheep farmers in the

colder parts of South Africa. The causal organism corresponds to the one causing lamb dysentery in Great Britain and a vaccine is issued to farmers for the inoculation of pregnant ewes. The article was written for farmers, and describes the symptoms and *post-mortem* changes in this disease. Methods of dealing with the disease by improved farming and by preventive vaccination are described.

GILL, D. A. (1936). **Pulpy Kidney of Lambs (Infectious Enterotoxaemia) and Allied Diseases.**—*N.Z. J. Agric.* **52.** 168-171.

This paper is a summary of one prepared for the 1935 conference of the Royal Society of New Zealand and brings up to date the knowledge of disease due to *welchii* types.

It mentions the unsuccessful vaccination of lambs in New Zealand with formalinized culture of *Clostridium ovitoxicum.* The use of antitoxic sera, however, proved very satisfactory, as only 0·38% of the 2,078 injected lambs contracted pulpy kidney disease while 2·3% of 2,123 controls died.

Vaccination of in-lamb ewes was considered as a possibility and trials in New Zealand of this means of control had satisfactory results.—C. S. M. HOPKIRK.

KOBUSIEWICZ, T. M. (1936). Wrażliwość koni na tężec po jedno i dwukrotnem uodpornieniu anatoksyną tężcową. [**Susceptibility of Horses to Tetanus after Single and Double Inoculation with Tetanus Anatoxin**].—*Wiad. weteryn.* **15.** 268-277. 2 tables. [14 refs.] [German summary].

75% of horses given a single inoculation of tetanus anatoxin, with or without the addition of tapioca, resisted infection with tetanus spores and tetanus toxin ten months later. Horses given two such injections were resistant after 16 months. Single and double immunization did not cause an increase of antitoxins in the serum.—A. SZWABOWICZ (Lwów).

I. KNIGHT, B. C. J. G. (1936). **Bacterial Nutrition. Material for a Comparative Physiology of Bacteria.**—*Spec. Rep. Ser. med. Res. Coun., Lond.* No. 210. pp. 182 + xii. Numerous tables. [Numerous refs.] London: H.M. Stat. Off. [8vo] [3s.]

II. WEDUM, A. G. (1936). **Quantitative Determinations of Carbohydrate Utilization by Bacteria.**—*J. infect. Dis.* **58.** 234-246. 5 tables. [Num. refs.]

I. This report gives a comprehensive survey of the physiology of bacteria based on bacterial nutrition. The various species of bacteria have been grouped according to their nutrient requirements. The autotrophic bacteria are first dealt with. The manner in which they are capable of synthesizing their protoplasm from simple inorganic carbon and nitrogen compounds, and of deriving their energy either from radiation, as in the case of the photosynthesizing bacteria, or from chemical reactions as in the case of the chemosynthesizing bacteria is described. The report then deals with the heterotrophic class of bacteria, and the increasing complexity of their nutrient requirements is pointed out, further classification being made accordingly. The differences in the complexity of the nutrient requirements are shown to be the result of the differences in ability of the organisms to synthesize their protoplasm. The synthesizing powers of the autotrophic bacteria are highly developed and they consequently need only simple compounds as nutrients, whereas the heterotrophic bacteria have less developed synthetic properties and are, therefore, unable to synthesize their protoplasm from simple substances, requiring, instead, more complex nutrients with a constitution approximately that of the protoplasm. It is shown that this progressive loss of synthetic ability is in accordance with the progressive development of pathogenicity and parasitism.

II. According to W., the determination of carbohydrate fermentation by the use of acid-indicators is not, for all bacteria, a true test of whether the organism can or cannot utilize the carbohydrate. This has been shown by comparing the results obtained by acid-indicators with those obtained by determining quantitatively the amount of carbohydrate remaining after the period of incubation. In the case of most of the aerobic bacteria the results obtained by the use of acid-indicators are in accordance with the results obtained quantitatively, but in the case of some organisms, *e.g.*, *Salmonella pullorum*, the fermentation of certain sugars, such as maltose, is delayed owing to the appearance of variant forms.—C. McG.

DISEASES CAUSED BY PROTOZOAN PARASITES.

I. PORTUGUESE GUINEA. (1935). École de médecine tropicale. Rapport de la mission médicale à la colonie de Guinée en 1932. [**Report of the Medical Mission to Portuguese Guinea in 1932**]. [DE SEQUEIRA, L. A. F.] pp. 86. 9 plates, numerous tables and charts, 1 map. Lisbon: Soc. nac. de tipografia. [8vo] [In French].

II. BOURGUIGNON, G. C., VAN DEN BERGHE, L., & VAN BOGAERT, L. (1936). La trypanosomiase expérimentale du cynocéphale par voie intrarachidienne. [**Experimental Trypanosomiasis of Monkeys** (*Cynocephalus*) **by Intraspinal Inoculation**].—*Ann. Soc. belge Méd. trop.* **16.** 9-36. 12 figs. on 6 plates, 7 tables. [7 refs.]

III. ROUBAUD, E., & COLAS-BELCOUR, J. (1936). Essai de transmission de *Tryp. gambiense* par *Gl. palpalis* à l'Institut Pasteur de Paris. [**Attempt to transmit** *Tryp. gambiense* **by** *G. palpalis* **at the Pasteur Institute, Paris**].—*Bull. Soc. Path. exot.* **29.** 500-504. 1 fig. [9 refs.]

IV. DUKE, H. L. (1936). **Antelopes as Reservoirs of** *Trypanosoma gambiense*. —*Trans. R. Soc. trop. Med. Hyg.* **30.** 129-131.

V. MESNIL, F., LEGER, M., & PÉRARD, C. (1936). Essais divers d'infection des poules par des trypanosomes pathogènes de mammifères. [**Experimental Infection of Fowls with Trypanosomes Pathogenic for Mammals**]. —*Bull. Soc. Path. exot.* **29.** 679-682. [7 refs.]

VI. DAVEY, J. B. (1936). **Trypanosomiasis.**—*Brit. med. J.* June 27th. 1321-1322.

VII. CORSON, J. F. (1936). **The Influence of Repeated Transmissions in Animals on the Virulence of** *Trypanosoma rhodesiense* **and** *Trypanosoma brucei*.—*Ann. trop. Med. Parasit.* **30.** 211-220. 1 table. [10 refs.]

VIII & IX. DUKE, H. L. (1936). **Studies on the Effect on** *T. gambiense* **and** *T. rhodesiense* **of Prolonged Maintenance in Mammals other than Man, with Special Reference to the Power of these Trypanosomes to Infect Man. I and II.**—*Parasitology.* **28.** 381-390 and 391-394. 1 fig. [14 refs.]

X. BEVAN, L. E. W. (1936). **Notes on Immunity in Trypanosomiasis.**—*Trans. R. Soc. trop. Med. Hyg.* **30.** 199-206. [10 refs.]

XI. CORSON, J. F. (1936). **A Second Note on a High Rate of Infection on the Salivary Glands of** *Glossina morsitans* **after Feeding on a Reedbuck Infected with** *Trypanosoma rhodesiense*.—*Ibid.* 207-212. 2 tables. [4 refs.]

XII. GILKES, H. (1936). **The Investigation of an Outbreak of Sleeping Sickness in Northern Rhodesia.**—*Ibid.* 213-222. 1 fig.

I. This report records an investigation into human and animal trypanosomiasis in Portuguese Guinea, and into the distribution of tsetse flies in that territory. The opinion is expressed that the human disease is of a benign form and

that probably a large number of infected persons recover. Apparently children contract a milder form of the disease than adults. The population of the colony is large, and apparently sleeping sickness does not tend to reduce it, nor is it considered that it is likely to do so.

Only a few observations were made on animal trypanosomiasis as the natives objected to their stock being handled, but species of *Tryp. congolense* and *Tryp. vivax* were encountered in cattle and goats, and *Tryp. brucei* in a horse. Subinoculation with these strains was carried out and it is pointed out that large quantities of blood containing *Tryp. congolense* are required to infect a different species of animal. The tsetse fly encountered belonged to the species *Glossina longipalpis*, *G. palpalis*, *G. submorsitans* and *G. fusca*, and dissection of these species showed that the heaviest infection with animal trypanosomes occurred in *G. longipalpis*, which exhibited a 22% infection with *Tryp. vivax* and an 11·5% infection with *Tryp. congolense*, whilst *G. palpalis* only exhibited a 1% infection with *Tryp. vivax*, and a 2·6% infection with *Tryp. congolense*. No investigation was made as to the species of trypanosome carried by *G. fusca*.

II. A record of attempts to infect baboons of the species *Papio jubilaeus* with *Tryp. brucei* and *Tryp. gambiense*. Out of five animals inoculated with *Tryp. brucei*, none developed infection. Out of six animals inoculated intrathecally with *Tryp. gambiense* only one became infected. This animal remained apparently healthy for two years, when it was discovered that its cerebrospinal fluid contained trypanosomes. Two days after this discovery it developed symptoms of cerebrospinal infection and died four months later. Two baboons inoculated with *Tryp. gambiense* (intraperit.) developed a blood infection which was heavy for two weeks and persisted intermittently until their death two months later.

III. The authors describe the raising of *G. palpalis* in Paris from pupae sent from Uganda, and an unsuccessful attempt to transmit a strain of *Tryp. gambiense* which had been maintained in g. pigs since 1934. Only one out of 100 tsetse flies developed a gut infection, and none of the flies developed any infection of the salivary glands.

IV. D. defends the conclusion of the Uganda Sleeping Sickness Commission in its finding that *Tryp. gambiense* may survive for long periods in antelopes and considers that the inoculation of human beings from the infected antelope would not have been conclusive as he does not accept the assumption that *Tryp. gambiense* always remains pathogenic for man or that *Tryp. brucei* never becomes pathogenic. The negative result of an attempt to infect man with the trypanosome harboured by the antelope would not justify the assumption that contamination with *Tryp. brucei* had occurred.

V. The authors record seven experimental attempts to infect fowls with *Tryp. gambiense*, *Tryp. brucei* and *Tryp. congolense*. No infection could be detected either by microscopic examination of the fowls, or by the subinoculation of g. pigs and mice.

VI. Commenting on the report of LAMBOURN and HOWAT on the detection of a human carrier of *Tryp. rhodesiense*, D. draws attention to two human patients who made apparent recoveries without treatment, and considers that it is the human carrier who is the main source of human infection. He considers that the recommendation of game destruction as a method of sleeping sickness control should now be reconsidered.

VII. This article discusses the changes which occur in strains of polymorphic trypanosomes during repeated mechanical passage through laboratory animals. It is pointed out that in tsetse fly the power of transmissibility and the power of infecting man may disappear relatively rapidly, or be retained for long periods.

A series of direct passages through rats usually increases the virulence of the strain for rats. Experimental passage of strains by tsetse transmission through rats, goats and sheep indicated that passage through rats increased the virulence for rats, but passages through goats and sheep did not increase the virulence for these animals. There was no clear indication that passage by tsetse through animals altered *Tryp. brucei* and *Tryp. rhodesiense* in regard to their virulence, reaction to human serum or resistance to drugs.

VIII. A record of attempts to infect situtunga, oribi and reedbuck with *Tryp. gambiense*. Two oribi and one situtunga developed infection but, out of a large number of *G. palpalis* fed on the infected antelopes, only one fly developed a gland infection. It is concluded that this trypanosome is unsuitable for survival in these species of antelope, and D. suggests that we must agree with the view expressed by WENYON that *Tryp. gambiense*, in ordinary circumstances, depends on man, and perhaps to a less degree on his domestic animals, for survival in nature. It is suggested that domestic stock are a safeguard to their owner rather than a menace in sleeping sickness areas, as only a small percentage of tsetse flies are infected with the trypanosomes, and domestic animals are likely to act as a buffer between man and the trypanosomes.

IX. A record of the experimental infection of human volunteers with seven strains of *Tryp. gambiense* which had been maintained in laboratory animals for various periods. One of the strains had lost its power of cyclical development in *G. palpalis*. One strain only infected four out of seven volunteers who were inoculated with it. Five wild strains of *Tryp. brucei*, some of which had been collected from *G. palpalis* and others from *G. morsitans*, all failed to infect human volunteers.

X. B. discusses the production of immunity to trypanosomiasis and claims that the tolerance acquired by infection and subsequent treatment with potassium antimonyl tartrate gives protection against the same species of trypanosome, but is unsatisfactory because it will not protect against another species, and may be reduced by adverse conditions. Experimenting on the production of immunity against *Tryp. rhodesiense* in rats, he found that young rats did not become infected *in utero*, but that, if they were inoculated at birth, the duration of the disease was prolonged to six months. They might recover from infection, but if that occurred they became susceptible to reinfection. If, however, they were reinoculated during the primary infection, a state of tolerance or resistance was acquired. The process was largely dependent upon adequate nourishment, and if the mother died the greatest care had to be exercised in providing a suitable diet.

XI. This paper records an infection rate of 47% in *G. morsitans* fed on a " mongee " species of reedbuck infected with *Tryp. rhodesiense*, though only 2·7% of flies were infected by feeding on a sheep infected with the same trypanosome. No salivary gland infection occurred in flies fed on a monkey.

XII. This article discusses the control of sleeping sickness in the Mumbwa district of Northern Rhodesia where the disease is considered to be endemic. The conclusion is reached that the game reserve should be closed for ten years, and the natives concentrated for treatment. The cotton industry should be preserved, and a road could be built which would pass through no villages and would avoid the infected area ; it should be provided with " fly posts " to prevent cars carrying tsetse fly into Mumbwa. Workers on road construction could be protected with " Bayer 205 ".—U. F. RICHARDSON.

I. LAUNOY, L. (1935). Suite à l'étude clinique et à celle du traitement de l'infection expérimentale du chat, du lapin et du cobaye, par *Tr. annamense*.

[**Treatment of** *Tryp. annamense* **Infection in Cats, Rabbits and Guinea Pigs**]. —*Bull. Soc. Path. exot.* **28.** 817-823. 1 table. [4 refs.]

II. LAUNOY, L., & LAGODSKY, H. (1936). Modifications du taux du fer sanguin dans l'infection expérimentale à *Trypanosoma annamense* chez le lapin. [**Changes in Iron Content of Blood in** *Tryp. annamense* **Infection of Rabbits**].—*C. R. Soc. Biol. Paris.* **122.** 633-636. [10 refs.]

III. LAUNOY, L., & LAGODSKY, H. (1936). Les protides et l'urée dans le sérum sanguin de lapins expérimentalement infectés par *Trypanosoma annamense.* [**Proteins and Urea in Blood Serum of Rabbits Infected with** *Tryp. annamense*].—*Ibid.* 1055-1058. 2 tables. [13 refs.]

IV. LAUNOY, L., PRIEUR, M., & ANCELOT, A. (1936). Suite à l'étude d'une souche de *Trypanosoma annamense* rendue résistante à la tryparsamide. [**Studies of a Strain of** *Tryp. annamense* **Resistant to " Tryparsamide "**].—*Bull. Soc. Path. exot.* **29.** 759-769. [7 refs.]

I. L. records experiments on the doses of " tryparsamide " and other drugs required to cure *Tryp. annamense* [*Tryp. evansi*] infections in rabbits, g. pigs and cats after severe symptoms of disease had developed. After somewhat irregular results with " germanin " and " tryparsamide ", a trivalent arsenical preparation, amino-phenyl-arseno-thiomalate of soda, which contained one-tenth of the arsenic in the required dose of " tryparsamide " and other pentavalent arsenicals, was tested on g. pigs, and found to produce sterile cures at a dose of 5 cg. per kg.

II. This article records estimations of the density, iron content and oxygen capacity of the blood of rabbits during the course of disease due to infection with *Tryp. annamense.* Blood for analysis was collected by cardiac puncture and weighed, and the iron content estimated. The results are expressed as mg. per c.c., the capacity of a given weight of blood being calculated from the specific gravity of blood taken from the ear. The density of blood was found to vary considerably with the nervous state of the animal. The oxygen capacity was estimated by multiplying the weight of iron in 1 c.c. of blood by 40.

In the first few weeks of disease the density of the blood, the iron content and the oxygen capacity were reduced to as low as 20% of their normal values. After reaching a minimum the oxygen capacity tended to become fixed at 50%, its value in the normal animal.

III. This article records that investigations into the effect of *Tryp. annamense* infection on the protein composition of the blood of infected rabbits revealed an increase in the globulin and a decrease in the albumin, whilst the non-protein nitrogen did not show any marked variation from normal.

IV. A record of comparisons between the reaction to treatment with various drugs of normal and " tryparsamide " resistant strains of *Tryp. annamense* in mice. The strain of the trypanosome resistant to " tryparsamide " proved to be more resistant than normal strains to " trypaflavine " and " germanin ". The authors claim that the " tryparsamide " fast strain also proved more resistant to an antimonial compound, but the evidence is relatively inconclusive as, in one series of experiments, the drug did not prove sterilizing in the case of the normal strain.

—U. F. RICHARDSON.

DISEASES CAUSED BY VIRUSES.

I. DOERR, R., BERGER, E., JADASSON, W., & SCHMIDT, G. W. (1932). Eigenartige Laboratoriumserkrankungen. [**Peculiar Laboratory Infections**].—*Schweiz. med. Wschr.* **62.** 395-398.

II. MUELLER, A. (1932). Ueber Molkereigrippe. [" **Dairy Influenza** "].—*Ibid.* 840.

III. URECH, E. (1934). La maladie des jeunes porchers. [**Swineherds' Disease**].—*Rev. méd. Suisse rom.* **54.** 416-426. 2 figs. [2 refs.]

IV. DEMOLE, M. (1934). Un cas de maladie du jeune porcher. [**A Case of Swineherds' Disease**].—*Ibid.* 655-656.

V. ROCH, M., DEMOLE, J. M., & MACH, R. S. (1935). Un type nouveau probablement spécifique de méningite lymphocytaire bénigne. Deux cas de "maladie des jeunes porchers". [**Two Cases of Swineherds' Disease**].—*Bull. Soc. méd. Hôp. Paris.* **51.** 1271-1278. 4 figs. [3 refs.]

VI. PENSO, G. (1936). Méningotyphus éruptif, sporadique, bénin à caractère professionnel. Maladie des fruitiers ou maladie des jeunes porchers. (Nouvelle entité morbide observée en France et présente aussi en Suisse et en Italie). [**Swineherds' Disease**].—*Rev. Hyg. Méd. prev.* **58.** 481-512. 4 figs. [15 refs.] [Translated from *Arch. ital. Sci. med. colon.* **17.** 65-94].

VII. FORGEOT, E. (1936). Para-typho-méningite des porchers. [**Paratyphoid Meningitis in Swineherds**].—*Bull. Soc. Sci. vét. Lyon.* **39.** 40-43.

VIII. CHARLEUX, G. (1936). La méningite bénigne des porchers. [**A Meningitis of Swineherds**].—*Lyon méd.* **67.** 650-657. [5 refs.]

IX. BERTOLINI, G. (1936). Una nuova zoonosi di origine suina ; il meningotifo eruttivo, sporadico, benigno, a carattere professionale (malattia di Penso). [**A New Disease of Man of Porcine Origin**].—*Azione vet.* **5.** 225-226.

X. ANON. (1936). Malattie nuove : la meningite dei porcai. [**A New Disease : Swineherds' Disease**].—*Clin. vet., Milano.* **59.** 621-624.

XI. DURAND, P., GIROUD, P., LARRIVÉ, E., & MESTRALLET, A. (1936). Transmission expérimentale à l'homme de la maladie des porchers. [**Experimental Transmission of Swineherds' Disease to Man**].—*C. R. Acad. Sci., Paris.* **203.** 830-832. 2 charts.

XII. DURAND, P., GIROUD, P., LARRIVÉ, E., & MESTRALLET, A. (1936). Réceptivité des animaux au virus de la maladie des porchers. [**The Susceptibility of Animals to the Virus of Swineherds' Disease**].—*Ibid.* 957-959. [1 ref.]

XIII. DURAND, P., GIROUD, P., LARRIVÉ, E., & MESTRALLET, A. (1936). Virulence des humeurs dans la maladie des porchers. [**The Virulence of the Body Fluids in Swineherds' Disease**].—*Ibid.* 1032-1034.

I. An account of cases of the disease, details of which are given in VI. The nature of the disease was not determined, but the authors considered that it might have been an infection derived from animals. Most of the article consists of a full discussion of clinical details and consideration of resemblances to and differences from various known diseases, together with an account of tests of the usual routine nature carried out to elucidate these points.

II. An account of cases, similar to those described in I, that occurred at a school of dairying in Switzerland. The routine of the school is described and the incidence of illness and freedom from infection in those engaged in the various types of work at the school are discussed.

III. U. describes investigations into 20 cases, carried out over the previous three years. The patients were all young men who were pig attendants. No cases came from farms but most of the surrounding piggeries of any size had provided cases. The learners in the piggeries change yearly and most of them contract the disease. The infection undoubtedly occurs in the course of the work as none of the other young men of the villages get the disease.

He considers that infection comes from the pig. He emphasizes that owing to fear of government restrictions the pig keepers rarely call in the veterinarian. When a pig dies they bury it and maintain silence about the occurrence of disease.

On 4 occasions patients became ill 3–4 days after pigs in their charge had died suddenly. In other instances a mild epidemic in the pigs had occurred 8–15 days before the human illness.

U. attempted to infect rabbits and g. pigs, but the results were negative. No accurate information is given about the pig disease.

IV. Description of a case presented at a medical meeting. D. speaks of the illness as " dengue du tommier ". He says that many cases occur in swineherds.

V. The authors speak of " méningite des laitiers ou des fruitiers " as of fairly frequent occurrence in Haute-Savoie. The condition has been spoken of as " grippe des laitiers ". They give an account of the illness in two patients.

VI. A study of a new disease entity in human beings with epidemiological data indicating that it is of a specific nature and contracted from close contact with pigs, the incidence of obvious disease in the pigs concerned not necessarily synchronizing with the human illness.

The human disease commences as an attack of pyrexia lasting for four or five days with a return to apparently normal health, followed by a relapse, symptoms of affection of the central nervous system usually being prominent during this phase. Recovery is complete and the mortality is nil. This disease has been wrongly diagnosed in the past, being named typhoid fever, meningitis, influenza, etc., according to the symptomatology.

P. had observed since 1926 that cases of the type in question occur in persons working in gruyère cheese " factories " in the Hautes Alpes department of France.

In this mountainous country small peasant graziers owning 2-10 cows deliver the milk to a very small central " factory " known in the French territory as a " fruitière ". Similar units operate in the adjacent Swiss and Italian territories. In these " factories " the work is largely done by the different members of the owner's family, though often with some hired help.

Each of those engaged in the work tends to keep to one of the special duties involved in the different processes of the cheese production. A piggery to use up the surplus milk products is part of the " factory " and the man who looks after the pigs does not usually assist in the actual cheese manufacture and is the only member of the staff in close contact with the pigs.

P. observed that it is only the pig attendants who contract the disease, that when persons not previously employed on this work are engaged, they frequently become affected within 2–4 weeks, and that those who have been affected appear to be immune. Infection does not occur from man to man.

The selective incidence in the pig attendants is striking as those working in the " factory " are in close contact with each other and the little community tends to be the local social centre, the inhabitants collecting in the evenings in the one large room of the building, which is generally the largest in the area.

Undiagnosed illness of the pigs has been observed sometimes when human cases have occurred, such names as " méningo-typhus des jeunes porcs " etc., being used. In some cases involvement of the central nervous system of the pigs has been striking. The author discusses briefly the common pig diseases of the area, but this part of the paper is the least satisfactory because there is insufficient evidence as to the type of ailment that may be involved.

P. discusses the aetiology of the disease and concludes, on epidemiological grounds, that an infective agent is probably responsible and that a non-flying arthropod vector may possibly be involved.

VII. A note drawing the attention of local veterinarians to this disease " dans les régions de fruitières ". F. says that the infection might be attributed to swine paratyphoid, but that it is under investigation.

VIII. C. discusses 19 human cases of benign lymphocytic meningitis encountered in Haute-Savoie, most of which were due to " maladie des porchers ". He says that cases frequently occur in the " fruitières " and discusses epidemiological factors which may help to indicate the nature of the infection.

IX & X. Deal with the ground covered by Penso.

XI. " Maladie des porchers " is so benign that it could be used for " pyrotherapy ". The authors injected into a healthy pig (intramusc.) blood of an affected pig taken on the fourth day of disease. After an incubation period of twelve days the former developed fever and blood was taken and inoculated (subcut. and intramusc.) into a man. Fourteen series of such passages in man were carried out.

The period of incubation in the inoculated human subjects was from six to twelve days and the resultant illness lasted from three to twenty-one days.

The authors discuss the symptomatology of the disease in the inoculated persons and consider that the results obtained afford evidence that a virus is the cause of " maladie des porchers ".

XII. The authors give details of inoculations into pigs, monkeys, cats, ferrets, rats, mice, rabbits, and g. pigs. In most cases the numbers dealt with were small – one or two to half a dozen or less.

Inoculation (intraperit.) into pigs of 20 to 30 c.c. of blood from a human case led to illness within five to eight days and blood and brain material from such pigs was found, on the occasions cited, to be infective to human beings, pigs, a rat and a mouse. The affected pigs developed irregular temperature reactions five to eight days after inoculation, with loss of appetite, diarrhoea and some coughing. The authors remark on the mild symptoms and suggest that in a piggery they might be overlooked.

Odd inoculations of affected human blood into monkeys (*Macacus rhesus*), cats and ferrets led to rise in temperature and in some cases there was successful subinoculation into the same species.

The rat is said to be the most convenient test animal. Mice and rabbits have been infected but not the g. pig.

XIII. Blood.—The blood of human cases was virulent in doses of from 1 to 40 c.c. from the second to the sixth days of disease, but the authors state that " for some unexplained reason " it was avirulent on the third day in the case of two subjects. Filtrate of blood taken on the second day of illness was found to be infective.

Cerebrospinal Fluid.—Inoculations with material from three cases failed to cause infection. Material taken on the tenth day of illness from another case was considered to be infective.

Mucous Membrane.—When material from the conjunctiva, of cases in which conjunctivitis was present, was rubbed into the conjunctiva and into the nasal or pharyngeal mucous membranes of the test subjects negative results were obtained.

Urine.—Subcutaneous inoculation of urine collected on the seventh to ninth days of illness set up the disease in human subjects. Pig urine was also found to be infective before and after filtration.

Faeces.—Filtrates of pig faeces caused disease in white rats.—W. A. P.

I. Anon. (1936). Recherches sur l'anémie infectieuse expérimentale du cheval. [**Research on Equine Infectious Anaemia**].—*Bull. Acad. vét. Fr.* **9.** 280-286.

II. PANISSET, L., & PFLIEGER, C. (1936). Le rythme quotidien de la température dans l'anémie infectieuse du cheval. [**The Daily Temperature Curve in Equine Infectious Anaemia**].—*Ibid.* 299-306. [6 refs.]

I. A review of a memoir by an anonymous author on his studies of E.I.A. It deals mainly with questions of diagnosis and the indications offered by its various clinical forms. The author tested extensively all the recognized serological methods of diagnosis on a number of artificially induced cases. His conclusions are given in detail.

As the article is an incomplete record of the memoir in question it is not of great value for reference purposes. The original memoir has not, apparently, been published and is not available.

II. Hitherto no serious study appears to have been made of the daily fluctuations of the temperature of animals affected with E.I.A. Certain authors have stated rather vaguely that the ordinary rule does not obtain, a higher reading being shown in the morning than in the evening. P. and P. made a special study of this point and this article records the results of their observations. They find that a majority of the affected animals periodically show a higher reading in the morning than in the evening. This, moreover, is most pronounced during exacerbations of fever. As a diagnostic indication, however, it is not sufficiently constant to be of any great value.—C. DAVENPORT.

I. ANON. (1936). La trachéo-bronchite infectieuse du cheval. [**Infectious Equine Bronchitis**].—*Rev. vét. milit.* **20.** 203-218. 3 tables. [11 refs.]

II. BERNARD, A. (1936). Zur Frage des seuchenhaften Hustens (infektiöse Bronchitis, Laryngotracheitis epizootica) der Pferde. [**Equine Infectious Bronchitis**].—*Tierärztl. Rdsch.* **42.** 582-585. 1 fig. [8 refs.]

III. KÖBE, K. (1936). Die Immunität beim seuchenhaften Husten des Pferdes. [**Immunity to Equine Infectious Bronchitis (Hoppegarten Cough)**].—*Berl. tierärztl. Wschr.* **52.** 325-326. [6 refs.]

I. The author classifies the common respiratory disorders of equines as follows :–

" FIÈVRE TYPHOÏDE " (syns. pasteurellose du cheval, " typhose équine ", Pferdestaupe). A generalized infection occasionally complicated by secondary pulmonary localization, first described by POELS, and caused by a filtrable virus.

" PARATYPHOSE ÉQUINE ". A salmonella infection.

PNEUMONIE INFECTIEUSE (syns. pneumonie contagieuse, pasteurellose du cheval, grippe). A generalized infection with secondary pulmonary lesions. The author considers that the primary cause is unknown but speaks of *Pasteurella septica* as a common secondary invader.

BRONCHITE INFECTIEUSE (syns. bronchite épizootique (Joly), laryngo-trachéite épizootique, grippe, Hoppegarten cough and skalma). An infectious condition caused by a virus (WALDEMANN, KÖBE and PAPE).

BRONCHO-PNEUMONIE INFECTIEUSE (syn. Brussels disease).

[It is necessary to consider the classification as the nomenclature is so confused. A table was given – *V. B.* **6.** 31. – showing certain synonyms. The table given below is an amplification.

	Influenza catarrhalis.	Influenza pectoralis.	Laryngotracheitis epizootica.
English	Equine influenza. Pink eye.	Equine influenza. Eq. cont. pl. pneumonia.	Eq. infectious bronchitis. Hoppegarten cough.
French	Fièvre typhoïde. Pasteurellose du cheval. Typhose équine.	Grippe des équidés. Pneumonie infectieuse. Pasteurellose du cheval. Maladie de Bruxelles. Typhus équin.	Bronchite infectieuse. Bronchite épizootique. Grippe. Trachéo-bronchite infectieuse.
German	Pferdestaupe.	Brustseuche. Brusseler Krankheit.	Hoppegarten Husten. Infectiöse Bronchitis. Skalma.

[A salmonella infection is included as " paratyphose équine ". It appears to be doubtful if this should be included. Skalma is said to be a synonym for laryngotracheitis epizootica. The accounts of laryngotracheitis epizootica – *V. B.* **5.** 268, 419 and 624. – do not agree very closely with those of skalma].

A description is given of infectious bronchitis as it occurs in French military establishments. The disease is of short duration, convalescence is brief, and there is a very low mortality in uncomplicated cases. The affection is readily transmitted from horse to horse and, in one instance, it is suspected that members of a troop became infected whilst marching through a district of Paris where a mild form of the disease was endemic. In certain barracks nearly 75 per cent. of the horses were affected. Prevention and cure are largely dependent upon hygienic measures. [Whilst the fact was not definitely ascertained, the condition described was most probably identical with the virus disease described by WALDEMANN *et al.*].

II. In B.'s experience of 50 cases, three clinical stages of this disease could be distinguished, *viz* a catarrhal stage, a stage of convulsive cough and a stage of convalescence. The first stage usually lasted seven days and the other two up to 14 days. The clinical aspects are detailed, and the characteristic nature of the spasmodic, convulsive, rasping cough which predominates during the second phase is emphasized. For therapeutic purposes, intramuscular injections of 10 to 15 c.c. of an ether, camphor and quinine mixture relieved strain on the circulatory system and are said to have eased the cough. Certain cases showed swelling of lymph nodes, and in such cases a streptococcus was isolated by puncture of the node and culture. Killed vaccine prepared with this streptococcus was considered to have had therapeutic value.

III. It has been found from direct reinfection experiments that about half the natural cases of infectious bronchitis develop an immunity to subsequent reinfection. Attempts to produce an active immunity by three injections (subcut.) of infective cell-free filtrate failed. All animals thus treated contracted the disease when reinfected intranasally about nine weeks after the third vaccination. Subcutaneous injections of as much as 250 c.c. of convalescent serum administered to foals, at the same time as an infective intranasal dose of virus, failed to protect the recipients from the disease.—E. J. PULLINGER.

CHASE, W. H., & HOBDAY, J. H. N. (1935). **Report of the Inoculation Campaign against Foot and Mouth Disease in the Bechuanaland Protectorate; 1934.** pp. 14. [4to] [Also appeared in *Vet. J.* **92.** 395-407].

A thorough inspection, following on the discovery of F. & M. disease in a herd of 300 head on trek, revealed the fact that the disease was wide-spread over an area of 60,000 square miles. To safeguard neighbouring territories, a cordon was placed around the area, a cattle-free belt varying from 30 to 100 miles in depth was established, and arrangements were immediately made to erect crushes and inoculate all the cattle in the area so as to pass the disease through it as quickly as possible, thereby eliminating risk of infection from it and shortening the quarantine period. Within three months, 262,000 cattle had been immunized by the injection of 2·5 c.c. of inoculum into each nostril, and a good inoculator, provided with efficient assistants, dealt with 1,500 animals in a day. The inoculum was prepared at a central station and distributed to the various centres by surface transport and by aeroplanes, for which eight landing grounds were prepared. It was delivered at the more inaccessible areas by dropping it attached to parachutes, 20 consignments being dropped in this way from a height of 500 to 800 feet.

The inoculum consisted of blood virus collected (from animals showing pyrexia) into a preservative of sodium citrate, sodium chloride, glycerin and water. To this was added a small quantity of macerated material from the lesions on the tongue, produced by the inoculation of an animal with infective material. During the routine production of inoculum, valuable data of the disease as it affected cattle in Bechuanaland, were collected. The disease was mild in character and spread slowly. The incubation period was longer than in Europe, unless adverse conditions, such as trekking over long distances, and wet weather, came into play. The disease was easily overlooked by both native and European owners, who are usually observant. It was indistinguishable from the disease as seen in Europe, but no permanent ill effects were noted after an attack. Spraying atomized inoculum over the heads of cattle did not produce the disease, and sheep and goats were found to be nearly proof against infection by inoculation. The inoculation campaign was apparently successful, as no outbreak occurred after nine months, although stock movements were allowed.—R. L. L. HART.

I. STAZZI, P. (1936). L'ultima infezione aftosa. [**Foot and Mouth Disease in Italy in 1935**].—*Azione vet.* **5.** 219-221.

II. TROMBINI, G. (1936). Il chemosiero finzi nell'afta-epizootica. [**Treatment of Foot and Mouth Disease with Finzi's " Chemoserum " (Iodoarsenamidophenol in Horse Serum)**].—*Profilassi.* **9.** 79-81.

III. MARTINI, I. (1936). Le lesioni dell' apparato di eccitamento e di conduzione nel cuore dei bovini nell'afta epizootica apoplettica. [**Lesions of the Sino-Atrial Node of the Heart in Foot and Mouth Disease**].—*Clin. vet., Milano.* **59.** 5-15. 2 text figs., 8 figs. on 4 plates. [13 refs.]

IV. STAZZI, P. (1936). Un nuovo esperimento di sieroattenuazione dell'afta. [**Trials with Foot and Mouth Disease Antiserum**].—*Ibid.* 219-223.

V. VIANELLO, G. (1936). Osservazioni e studi sull'afta epizootica. Parte Seconda. Decorso dell'afta nella cavia. [**Research on Foot and Mouth Disease**].—*Ibid.* 227-250. 11 tables. [13 refs.]

VI. PASSERINI. (1936). Profilassi dell'afta. [**Control of Foot and Mouth Disease in Italy**].—*Ibid.* 272-273.

I. As F. & M. disease was rampant in Italy in 1935, it was decided to carry out a large-scale experiment to determine the value of serum-virus inoculation. The serum was prepared in cattle and titrated before issue by Waldmann's method.

At the beginning of an outbreak it was given only to apparently healthy animals, the doses being from 25 to 35 c.c. After inoculation, lymph from a fresh case of the disease was applied to scarified skin, or the animal was given food contaminated with infective lymph.

This treatment reduced the losses by about 50% in some herds. In others, however, the results were not so successful and it is thought that the treatment should have been repeated at least twice at intervals of from 10 to 15 days. It is suggested that losses might be still further reduced by applying this treatment to animals in herds as yet unaffected, as well as taking the usual precautionary measures when the disease first appears in a district.

II. Finzi's " chemoserum " was used in an outbreak in a herd of 180 cattle. No precautions were taken to prevent contact between affected and unaffected animals. Every animal was injected with 40 c.c. of " chemoserum " and those which were definitely affected or showed a rise of temperature after they had received the first dose were re-injected on the following day. On neighbouring farms, the disease ran an acute course, but it ran a mild course in the treated animals. There were no complications and no deaths. Moreover, it did not spread throughout the herd.

III. Serial sections of the sino-auricular node and the bundle of His were examined in order to determine whether changes in these tissues could be seen which would account for the tachycardia which develops during an attack of F. & M. disease. In every case examined, a parenchymatous degeneration of the heart muscle was seen, especially at the sino-auricular node. This was accompanied by a lymphocytic infiltration and a connective tissue reaction. The lesion appeared sufficient to produce heart-block during life.

IV. Anti-F. & M. disease serum against the " A " type of virus was prepared in cattle recently recovered. Ten to 12 injections (intraven.) were given over a period of 7 to 8 weeks ; the serum was tested on g. pigs before issue.

S. considers that the use of serum alone is insufficient to combat an outbreak of the disease and that infective lymph should be given after the serum.

V. An extensive study of F. & M. disease virus in g. pigs. He emphasizes the well-known need to adapt a virus to g. pigs before it can be satisfactorily and regularly used for work on these animals. He gives details of results so obtained, these being well-known. Tests of the value of hyperimmune serum on g. pigs are described.

VI. In a recent outbreak five cattle, which were known to have been in contact, but which had not yet developed symptoms, were injected with 800 c.c. of hyperimmune serum. Three days later, they developed a mild attack of the disease, from which they quickly recovered. Fourteen cows which were kept in an adjoining shed received between them 1,200 c.c. of serum and none of them developed the disease.—J. A. Nicholson.

Schoop, G. (1936). Ansteckende Gehirnentzündung beim Fuchs. [**Infectious Encephalitis in the Fox**].—*Dtsch. tierärztl. Wschr.* **44.** 101-104. 3 figs., 1 table, 1 chart. [6 refs.]

Encephalitis was common on fox farms in Germany in 1935. S. investigated two outbreaks, one in spring and the other in early winter. In both cases young foxes, four weeks old or more, were alone affected, the adults remaining well. Morbidity was 50%, and mortality of those affected nearly 100%. The course of illness was acute and the outbreaks were over within a period of 12 days. The young foxes showed general nervous disorder, including paralysis and blindness, and death after only a few hours' illness.

Autopsies on ten foxes showed a congestive tendency of the body organs, including the brain. All foxes harboured helminth parasites (*Eucoleus aerophilus*, *Crenosoma vulpis*, *Toxocara canis*, *Uncinaria stenocephala*, and *Capillaria plica*).

Attempts were made to transmit the disease to mice, g. pigs, rabbits, dogs and one cat, using brain suspension from natural cases, but with no success. Even subdural inoculation into dogs failed. A few silver foxes were obtained and it was possible to infect them with the typical disease giving unfiltered brain suspension by subdural and intramuscular inoculation as well as by feeding half a brain. Brain filtrate was given subdurally to one fox, which remained well. Proof of the presence of a filtrable agent was thus not obtained.

It was found that two foxes, which survived intramuscular infection, were later immune to subdural infection.—J. E.

I. HAUGE, K. (1936). Smittsom hjernebetendelse hos sølvrev. [**Infectious Encephalitis of Silver Foxes**].—*Norsk VetTidsskr.* **48.** 290-294.

II. KJOS-HANSEN, J. (1936). Smittsom hjernebetendelse hos rev. [**Infectious Encephalitis of Foxes**].—*Ibid.* 339-341. [1 ref.]

I. H. reports the occurrence in 1935 on a silver fox ranch of 11 cases of nervous disturbance accompanied by universal convulsions; death occurred in nearly all cases and H. suggests that the disease is identical with an enzootic encephalitis of foxes described by GREEN and SCHILLINGER (U.S.A.) [*V. B.* **6.** 129.] and SCHOOP (Germany) [above]. He gives a short description of the symptoms, course and *post-mortem* findings, and adds a summary of SCHOOP's report of the disease. [No transmission experiment was undertaken].

II. Two consecutive cases of a nervous disturbance in adult silver foxes on the same ranch came to K.-H.'s notice in 1936. *Post-mortem* examinations were carried out and infectious encephalitis was suggested as the cause of death. [No transmission experiment confirmed the suggestion].—GUSTAV NAERLAND (OSLO).

I. SHOPE, R. E., & FRANCIS, T., Jr. (1936). **The Susceptibility of Swine to the Virus of Human Influenza.**—*J. exp. Med.* **64.** 791-801. 8 figs. on 4 plates. [17 refs.]

II. SMITH, W. (1936). **The Complement-Fixation Reaction in Influenza.**—*Lancet.* **231.** 1256-1259. 4 tables. [8 refs.]

III. BROWN, H. W. (1936). **The Occurrence of Neutralizing Antibodies for Human Influenza Virus in the Sera of Persons with Various Histories of Influenza.**—*Amer. J. Hyg.* **24.** 361-380. 1 fig., 6 tables. [13 refs.]

IV. WELLS, W. F., & BROWN, H. W. (1936). **Recovery of Influenza Virus Suspended in Air and its Destruction by Ultra-Violet Radiation.**—*Ibid.* 407-413. 2 tables. [9 refs.]

I. The human influenza virus alone produced a disease in swine which was clinically and pathologically indistinguishable from that caused by the swine influenza virus alone, but the human virus in combination with *Hemophilus influenzae suis* produced an illness resembling mild swine influenza. The pneumonia was less extensive than that seen in swine influenza.

Passage through swine failed to enhance the virulence of the human virus, and contact infection succeeded in only one out of four attempts.

II. Influenzal antibodies in the sera of man and of experimental animals can be titrated by a complement-fixation test. In most cases the results are in agreement with those obtained by mouse-protection tests but, whereas the latter tests distinguish between the human and porcine viruses, the complement-fixation tests do not.

III. The presence of antibodies which neutralized the virus of human influenza, was demonstrated, in approximately equal amounts, in the sera of (1) adults who had not had influenza for 18 years; (2) adults who had not to their knowledge had influenza, and (3) young children who had never been affected.

IV. A liquid suspension of influenza virus was atomized into the air of a dark tank and, after definite intervals of time, samples were withdrawn and tested for virus by the inoculation of ferrets. Virus was found to be still suspended in the air after 30 minutes, but when the air was irradiated with ultra-violet light it was not infective for ferrets after 10 minutes.—GWILYM O. DAVIES.

DE KOCK, G., & ROBINSON, E. M. (1936). **African Swine Fever.**—*Fmg S. Afr.* **11.** 27-28. 4 figs.

A description of the symptoms observed and *post-mortem* changes occurring in the form of swine fever met with in South Africa is given in this article written for farmers. Mention is made of the part played as carriers of the infection by the wart hog and bush pig.

The preventive measures for the control of the disease are given in full detail. In one big outbreak in Johannesburg the *post-mortem* changes shown by some of the pigs closely resembled those observed in the acute form of swine fever as seen in Europe and America.

CUVERKALOV, D., & KUČERENKO, I. (1935). Izmenenie belkovich frakcij sivorotki u svinej pri giperimmunizacii i eksploatacii ich na biofabrikach. [**Variations in Protein Fractions of Serum of Swine during Hyperimmunization against Swine Fever**].—*Trud. vsesojuz. Inst. eksp. Vet.* **10.** 85-92. 4 graphs. [3 refs.] [French summary].

The protein fractions of the sera of nine pigs were ascertained by Howe's method, the sera of four being tested separately, the sera of five being mixed before testing, and an average being taken for the whole nine. A graph shows the average protein, globulin and albumin fractions of the sera at various periods during hyperimmunization. The following conclusions were arrived at:—(1) during hyperimmunization the total amount of protein in the serum increases notably: this increase is observable after the first injection of the antigen; (2) the protein increase is chiefly to the credit of globulin; (3) every increase of the globulin fraction is accompanied by a simultaneous decrease of the albumin fraction, and conversely, and (4) the most notable protein increase is observable after the first injection of the antigen: subsequent injections do not cause great changes in the protein fraction of a serum.

HOFFMANN, F. (1936). Alkalmas-e a Sarnowiec-féle intracután próba vagy a Zuwerkarlow-Kutscherenko-féle praecipitációs eljárás a sertéspestis megállapïtására? [**Diagnosis of Swine Fever by Sarnowiec's Test and the Precipitation Test**].—*Allatorv. Lapok.* **59.** 107-109. [2 refs.]

After carrying out tests with healthy, diseased and immune pigs, H. considers (1) that Sarnowiec's intracutaneous or intravenous test is not suitable for the diagnosis of swine fever, as it does not give sufficiently clear results, and (2) that the Zuwerkarlow [?Cuverkalov]-Kutscerenko precipitation test does not successfully differentiate swine fever from other diseases of swine. The test merely depends on the presence of albuminuria.

ALEXANDER, R. A. (1936). **The *in vitro* Cultivation of the Filterable Viruses, with Particular Reference to Vaccine.**—*S. Afr. med. J.* **10.** 467-470. [Num. refs.]

A. briefly reviews the earlier attempts at cultivation of the filtrable viruses and then goes on to a more detailed account of some of the more recent work on this subject. Reference is made to the work of PARKER and NYE on the cultivation of vaccinia by the tissue culture technique of Carrel, and subsequently that of MAITLAND, using a fluid medium which was claimed to be free from living cells, but probably did contain them though not in an active state of multiplication. The greater part of the article is devoted to the cultivation of viruses on the chorio-allantoic membrane of the developing hen's egg.

A. describes his adaptation of this technique for the cultivation of the virus of horse-sickness, certain modifications of Goodpasture's technique having been introduced.—E. M. ROBINSON.

I. OERSKOV, J., & SCHMIDT, S. (1936). Infektionsmechanische Untersuchungen über die Geflügelpestinfektion der Maus, mit besonderer Berücksichtigung der Aluminiumhydroxydwirkung. **[Infection of Mice with Fowl Plague Virus Adsorbed on Aluminium Hydroxide]**.—*Zlb. Bakt. I. (Orig.).* **137.** 1-9. 4 tables.

II. SCHMIDT, S., OERSKOV, J., & STEENBERG, Else. (1936). Immunisation active contre la peste aviaire. **[Active Immunization against Fowl Plague]**.—*Biol. Medd., Kbh.* **12.** No. 6. pp. 21. 2 figs. on 1 plate. [3 refs.] [8vo] [Kr. 1.25] [In French].

I. Two strains of virus were examined, the one being highly virulent for both birds and mice, and the other highly virulent for birds but relatively avirulent for mice. The first strain, when inoculated (intraven.) into mice, disappeared from the blood stream within 20 minutes, and within 90 minutes was demonstrable in the liver, spleen and brain, whilst after 23 hours it had disappeared from the brain. The secondary septicaemia appeared within 48 hours; this subsequently waned and by the tenth day the virus had disappeared from all the tissues.

When the second strain of virus was used, the primary spread of virus did not reach its maximum for 24 hours. The secondary septicaemia appeared on the third day. When this second strain of virus adsorbed on to $Al_2(OH)_6$ was used, there was a greater lag in the appearance of all the stages. When the strain thus treated was injected (subcut.) it was retained in the local lymph node for some hours; the spread throughout the body took from two to three days and the secondary septicaemia did not appear for three or five days. Tissue of mice injected with adsorbed virus was of low virulence for fowls. It is emphasized that adsorption on to Al_2 $(OH)_6$ in no way altered the course of the virus spread, but the rate of its progress was retarded.

II. Fowl plague virus, when adsorbed on to $Al_2(OH)_6$, becomes lowered in virulence but retains its immunizing ability unimpaired. The process of adsorption should be carried out carefully to ensure uniform distribution of the virus and, if possible, the virus should be separated from gross particles of meat by differential centrifugation. Fowls immunized by a single injection of adsorbed virus are strongly resistant to subsequent reinoculation with virulent culture. It was noted that hyperimmunization was occasionally followed by paralysis (a phenomenon sometimes encountered with toxin hyperimmunization). Virus modified by adsorption apparently remains modified, as an emulsion of the brain of a mouse which has been inoculated with adsorbed virus is only mildly pathogenic for other mice. In addition it has lost its immunizing power through passage.—E. J. P.

PARASITES IN RELATION TO DISEASE (ARTHROPODS).

ŽURAVLEV, M. S. (1936). Kleśćevij paralič u ovec, vizvannij kleśćami *Ornithodorus lahorensis*. [**Tick Paralysis in Sheep Caused by** *O. lahorensis*].—*Sovyet. Vet.* No. 5. pp. 78-82. 1 table.

A mass infestation by the tick *O. lahorensis* (adult and nymph forms) took place in 1931 on a state farm in the Kirgiz region (south-west Siberia). The sheep were heavily infested, up to 500 specimens having been collected from one animal. Affected sheep ran aimlessly about, with their heads thrown back; they swayed and finally fell down in an almost comatose state. The temperature was normal, falling to subnormal shortly before death. Lambs were more frequently affected than adults. The blood vessels were engorged. There was extravasation of blood at the sites of tick bites.

From Z.'s account of the *post-mortem* examinations it appears that there were no other important lesions.

DE VRIES, A. H. (1936). **Blowflies, and Locust Poisoning. Scarcity of Blowflies during the Season, 1934-35.**—*Fmg S. Afr.* **11.** 21-22.

The author expresses the opinion that the decrease in the number of blowflies during the 1934-1935 season was associated with the very extended campaign carried out against locusts by spraying. A second factor to be considered was the climatic one, especially abnormal and unseasonable cold weather which retarded the development of the insects.—E. M. ROBINSON.

I. MOGGRIDGE, J. Y. (1936). **Experiments on the Crossing of Open Spaces by** *Glossina swynnertoni*.—*Bull. ent. Res.* **27.** 435-448. 3 figs., 5 tables.

II. MOGGRIDGE, J. Y. (1936). **Some Observations on the Seasonal Spread of** *Glossina pallidipes* **in Italian Somaliland with Notes on** *G. brevipalpis* **and** *G. austeni*.—*Ibid.* 449-466. 1 text fig., 18 figs. on 3 plates. [3 refs.]

I. The object of the experiments was to ascertain the capability of *G. swynnertoni* to pass from a "fly"-infested area across an artificially made clearing on (1) game, (2) game and man, and (3) man, during both the wet and the dry seasons. (Cattle were used to represent game).

In the wet season, "fly" were carried both on game and man, although decreasing in numbers as the distance increased, across a clearing 1,575 yards wide, whereas in the dry season, at a comparatively short distance from the bush, "fly" had left the animals, although remaining with man for a longer period and for a greater distance.

In another set of experiments it was found that, during the season, when the grass was unburnt, "fly" were not attracted out of "fly bush" to game in clearings at a greater distance than 100 yards. After the grass had been burnt off and visibility increased, "fly" were found to be attracted up to a distance of 300 yards.

It was noted that an ox, yellowish-red in colour, was far less attractive to *G. swynnertoni* than either a black or a white one.

II. These observations were carried out over a month with a view to obtaining data for use when it may become necessary to deal with *G. pallidipes* at some future time in Tanganyika Territory. An interesting account is given of the geographical features, the climate, the fauna and the flora of the area in which irrigation by means of canals from a river has been introduced, and as a result of which changes in the vegetation have occurred. The density of *G. pallidipes* increases in the wet season or in thickets, due principally to increased longevity of the "fly" and to conditions being then favourable for breeding. Deciduous

thicket is the essential constituent of the vegetation of the true habitat of *G. pallidipes*, which cannot breed and maintain itself permanently in its absence.

" Fly " is spread out of infested areas into farming areas by motor vehicles and natives carrying loads. The " fly " is then able to maintain itself owing to the natural humidity assisted by the evaporation from the irrigation canals. Trees planted as wind breaks also favour spread of " fly " by providing cover.

On an island in the Juba river, *G. pallidipes*, *G. brevipalpis* and *G. austeni* were found to be numerous, *G. brevipalpis* only being found in the main forest in which *G. pallidipes* is not a normal inhabitant.

A fungus seen on the abdomen of a tsetse taken in the main forest was similar to that observed in Tanganyika Territory.—R. L. L. HART.

THOMPSON, G. B. (1936). **The Parasites of British Birds and Mammals. VI. Some Parasites of the Red Deer and Wild Cat.**—*Scot. Nat.* pp. 75-78. [8 refs.]

A brief reference is made to *Trichodectes subrostratus* in cats, and *Ixodes ricinus* is reported as occurring on a stag (red deer).—J. E.

PARASITES IN RELATION TO DISEASE (HELMINTHS).

I. VAN VOLKENBERG, H. L. (1934). **Parasites and Parasitic Diseases of Cattle in Puerto Rico.**—*Bull. P. R.* [*fed.*] *agric. Exp. Sta.* No. 36. pp. 36. 4 figs. [3 refs.]

II. KELLER, A. E., & LEATHERS, W. S. (1936). **The Incidence and Distribution of** *Ascaris lumbricoides*, *Trichuris trichiura*, *Hymenolepis nana*, **and** *Hymenolepis diminuta* **in Thirty-Six Counties in Kentucky.**—*Amer. J. Hyg.* **23.** 216-230. 1 fig., 10 tables, 2 maps. [13 refs.]

III. SCHMID, F. (1936). Hygienische Massnahmen zur Bekämpfung der wichtigsten Nematodenerkrankungen unserer Haustiere. [**Hygienic Control of Nematode Infestation**].—*Munch. tierärztl. Wschr.* **87.** 265-267. [14 refs.]

IV. HINMAN, E. H., & BAKER, D. D. (1936). **Helminthological Survey of 1,315 Dogs from New Orleans with Special Reference to Age-Resistance.** —*J. trop. Med.* (*Hyg.*). **39.** 101-104. 1 table. [Numerous refs.]

I. The first eight pages of this bulletin are devoted to general notes on host-parasite relationships, and disease production and control; the remainder to a particular consideration of some of the most important parasites in Puerto Rico, including protozoa, parasitic worms and insects.

II. This survey of worm infestation in the human population of a large area of Kentucky emphasizes the relative importance of hygiene over anthelmintic treatment. This applies particularly to ascaris, against which anthelmintic treatment is of little avail where conditions are unhygienic. [This point has been emphasized in other similar surveys and is applicable to the control of ascaris in pigs under farm conditions].

III. Very few of the numerous parasites of domestic stock respond satisfactorily to anthelmintic treatment. Preventive measures are, therefore, very important in the control of these parasites. S. discusses the various measures which may be employed (a) for the destruction of eggs and larvae; (b) for the retarding of their development, and (c) for the diminution of their infectivity.

IV. This paper records the incidence of parasitic worms in correlation with age and sex, the following interesting points having been observed. Season, sex and breed appeared to have no influence on the occurrence of the parasitic worms.

Mature *Dirofilaria immitis* were found in 26 sexually immature dogs, showing that this parasite may develop to maturity within four or five months. Their relative scarcity in adult dogs suggested that an age immunity is developed towards *Toxocara canis*, but the even incidence of *Ancylostoma caninum* in dogs of all ages suggested that there is no age resistance to natural infections with this parasite.
—E. L. TAYLOR.

I. CORT, W. W. (1936). **Studies on Schistosome Dermatitis. I. Present Status of the Subject.**—*Amer. J. Hyg.* **23.** 349-371. [Numerous refs.]

II. TALBOT, S. B. (1936). **Studies on Schistosome Dermatitis. II. Morphological and Life History Studies on Three Dermatitis-Producing Schistosome Cercariae,** *C. elvae* **Miller, 1923,** *C. stagnicolae* **n. sp. and** *C. physellae* **n. sp.** —*Ibid.* 372-384. 3 figs., 1 table. [12 refs.]

III. CORT, W. W., & TALBOT, S. B. (1936). **Studies on Schistosome Dermatitis. III. Observations on the Behavior of the Dermatitis-Producing Schistosome Cercariae.**—*Ibid.* 385-396. [16 refs.]

I. A brief review is given of the publications on this subject since the author's first observation of schistosome dermatitis in 1928, dealing in turn with the cercariae responsible, the pathology, geographical distribution and attempts at control. [Schistosomes capable of maturing in domesticated birds are involved].

II. These three species, capable of producing dermatitis in man, found respectively in *Limnaea stagnalis*, *Stagnicola emarginata* and *Physella parkeri*, are described. Attempts to infect domestic ducks, pigeons, gulls, rats and mice failed.

III. A careful study was made of the behaviour of *C. douthitti*, *C. elvae*, *C. physellae* and *C. stagnicola*, and it was found possible to identify any of the species quite easily by watching their behaviour in water in small bottles with a low-power hand lens.—E. L. TAYLOR.

I. JONES, Myrna F., & HORSFALL, Margery W. (1935). **Ants as Intermediate Hosts for Two Species of** *Raillietina* **Parasitic in Chickens.**—*J. Parasit.* **21.** 442-443.

II. JONES, Myrna F., & HORSFALL, Margery W. (1936). **The Life History of a Poultry Cestode.**—*Science.* **83.** 303-304.

I. Two species of ants, *Tetramorium caespitum* and *Pheidole* sp. were found to act as intermediate hosts for *R. echinobothrida* and *R. tetragona*. The cysticercoids may be differentiated by the rostellar hooks (*R. tetragona*, 100 rostellar hooks arranged in one row, and *R. echinobothrida*, 200, arranged in two rows).

II. The larva of *R. echinobothrida*, the cestode which causes nodular disease in poultry, was found to be able to develop in the ant, *T. caespitum* Linné. Segments were first passed 19 and 20 days after the cysticercoids had been fed to chickens.—E. L. TAYLOR.

STRONG, R. P., SANDGROUND, J. H., BEQUAERT, J. C., & OCHOA, M. M. (1934). **Onchocerciasis with Special Reference to the Central American Form of the Disease.** pp. xiv + 234. Numerous text figs., 6 plates, 11 tables, 2 maps. [Numerous refs.] London: Humphrey Milford, Oxford University Press, and Cambridge, Mass: Harvard University Press. [4to] [21s.]

This is a well-presented and beautifully illustrated monograph on onchocerciasis in Central America, dealing with every aspect of the disease. Clinical and pathological observations all apply to the human subject, but the lengthy section on the life-histories, habits, breeding and rearing of Simuliidae, and on the description of adult and microfilarial *Onchocerca*, and the validity of the various

species, are of considerable veterinary interest. The following species are not thought to have sufficient morphological differences to warrant their continued recognition :– *O. cervicalis* Railliet and Henry, 1910, *O. bovis* Piettre, 1912, *O. indica* Sweet, 1915, and *O. caecutiens* Brumpt, 1919, and are relegated to the synonymy of *O. reticulata* Diesing, 1841, *O. gutturosa* Neuman, 1910, *O. gibonsi* Cleland and Johnston, 1910, and *O. volvulus* (Leuckart, 1893).—E. L. Taylor.

Stefanski, W., Strankowski, M., & Nagórski, F. (1936). Nowy przypadek występowania nerkowca olbrzymiego *Dioctophyme renale* w jamie piersiowej u kota. [*D. renale* **in the Thorax of a Cat**].—*Wiad. weteryn.* **15.** 219-225. 3 figs. [7 refs.] [French summary].

A young female *D. renale* was found in the right pleural cavity of a cat killed when severely ill. The worm had reached the pleural cavity *via* the peritoneal cavity after perforating the ligamentum coronarium and the diaphragm.

—A. Szwabowicz (Lwów).

I. Matoff, K. (1936). Die experimentelle Muskeltrichinellose beim Hunde und bei der Katze. [**Experimental Trichinella Infestation in Dogs and Cats**].—*Tierärztl. Rdsch.* **42.** 86-91 and 106-110. 4 tables. [Num. refs.]

II. Matoff, K. (1936). Bei Tauben auf enteralem Wege erzeugte Muskeltrinchinellose. [**Oral Infection of Pigeons with Trichinae**].—*Ibid.* 401-404. [9 refs.]

III. Kalwaryjski, B. E. (1936). Studien über die Trichinellen. II. Ueber Jodsilberimprägnation der Muskeltrichinellen. [**Studies on Trichinella. II. Iodine-Silver Impregnation of Muscle Trichinae**].—*Zlb. Bakt. I.* (*Orig.*). **137.** 303-312. 4 figs. [6 refs.]

I. Observations have been made by other investigators showing that cats and dogs more often become naturally infected with trichinella than do pigs. Matoff carried out some investigations to ascertain the suitability of these carnivores as hosts for *T. spiralis*. Young cats and dogs were found to become infected easily, using quite small infective doses of larvae. Dogs over a year old could also be infected, but not so easily ; the same was found to apply to cats, and only a few trichinae could be found in the muscles. It was concluded that dogs and cats are not good hosts for this parasite, and on account of the scarcity of larvae in the muscles of infected adult dogs or cats, infection might be very difficult to detect by the examination of crush preparation of muscle.

II. Previous work on the reaction of fowls and pigeons to infection with trichinae suggested that they were resistant to the development of the parasite in the muscles, although the adult worms might develop in the intestines. Matoff injected young pigeons in the nest, while still being fed by the parent birds, and found that, not only do the adult worms develop in the intestine, but the larvae appear abundantly in the muscles. This suggests that the resistance of adult birds is of the nature of an age immunity.

III. K. describes a new method of staining trichinae in muscle, which, judging by his photomicrographs, gives a very pretty result. A small crush preparation of infected muscle is placed in a 0·1 % to 2 % solution of iodine in potassium iodide, and left there for ten minutes; it is then washed and placed in 2·5 % sodium thiosulphate solution to differentiate, *i.e.* until the stain has come out of the muscle tissue. After washing again in distilled water, it is next placed in a mixture of 10 % silver nitrate in equal parts of a solution of " triple caustic " ammonia. The iodine coloration then disappears and gives place to an impregnation with silver nitrate. It is then washed and differentiated in sodium thiosulphate

until the parasites stand out in various intensities of black, according to the length of the latter treatment.—E. L. TAYLOR.

IMMUNITY.

I. WEISSFEILER, J. (1935). **Heteroallergy in Tuberculosis. The Tissue Reaction of Tuberculous Animals to Pathogenic Microörganisms.**—*Amer. Rev. Tuberc.* **32.** 719-723. 4 figs. [6 refs.]

II. LURIE, M. B. (1936). **On the Mechanism of Immunity in Tuberculosis. The Host-Parasite Relationship under the Conditions of a Localized Agar Focus of Infection and the Generalization of the Diseases in Normal and Immunized Rabbits.**—*J. exp. Med.* **63.** 923-946. 13 figs. on 3 plates, 4 tables. [15 refs.]

III. MAIGNON, F. (1936). Anaphylaxie, tuberculose et système nerveux végétatif. [**Anaphylaxis, Tuberculosis and the Sympathetic Nervous System**].—*Bull. Acad. vét. Fr.* **9.** 324-332. 1 table. [4 refs.]

IV. CARLIFANTI, E. (1936). Allergie tuberculeuse et anaphylaxie. [**Tuberculous Allergy and Anaphylaxis**].—*Ann. Inst. Pasteur.* **57.** 134-151. 3 figs. [Numerous refs.]

V. SAENZ, A. (1936). Etat d'allergie intense révélé par l'étude de la sensibilité tuberculinique et du phénomène de Koch chez des cobayes inoculés avec des variétés R et S de bacilles aviaires morts enrobés dans l'huile de vaseline. [**Allergic Reactions in Guinea Pigs Inoculated with "R" and "S" Variants of Dead Avian Tubercle Bacilli**].—*C. R. Soc. Biol. Paris.* **121.** 1561-1564. [5 refs.]

I. W. studied tissue reactions in 16 rabbits and 14 g. pigs (some normal and the others tuberculous) following inoculation (intraderm.) of *Staphylococcus aureus.* A typical abscess was formed in normal animals. In tuberculous animals a light yellow pustule surrounded by a narrow zone of hyperaemia, was formed, and healing proceeded under scab formation. Histologically the abscess of normal animals was typical but, in tuberculous animals, Koch's phenomenon (rapid exudation of leucocytes in a restricted manner around a central necrotic zone, followed by sequestration) was the type of lesion produced.

As W. has previously shown that, when non-pathogenic bacteria are used as inocula, in tuberculous animals, Koch's phenomenon develops, he is of the opinion that this hetero-allergy is a non-specific reaction and not due to antagonism between two infecting agents. These findings offer an explanation for the apparent resistance of tuberculous animals to other infections.

II. L. used normal and BCG-vaccinated rabbits which were inoculated subcutaneously with an assessed dose of virulent bovine tubercle bacilli, incorporated in melted agar to which was added either indian ink or trypan blue. He sets out his cultural findings in four tables showing the behaviour of the bacilli and their spread throughout the body. He also made a histological comparison of the reactions in each group of rabbits.

The localization of carbon particles, trypan blue and tubercle bacilli at the site of inoculation increased in proportion to the density and amount of fibrin in immunized rabbits. These extracellular factors overcame reinfection with small doses at the same site, but large doses caused a more rapid dissemination of the bacilli because of the greater lymph flow in immunized rabbits. However, mononuclear phagocytes showed a high opsonic index in immunized rabbits, and such invading bacilli were rapidly destroyed or retarded from multiplying.

A virulent primary infection caused the best immunity response.

III. M. showed that there is a relationship between the sensitivity of each animal species towards anaphylaxis, tuberculosis and substances poisonous to the sympathetic and para-sympathetic nervous systems. He found that g. pigs were the most and rats the least susceptible to all three conditions. Man was shown to have wider idiosyncrasies of susceptibility to tuberculosis because two forms of the disease occur, the first being a toxic form with minimal lesions and very great prostration, and the second the acute type with extensive lesions and little upset to general well-being.

The acute form is generally found in cattle, but g. pigs are affected with the more rapidly fatal toxic form.

M. refers to recent work on the development of tuberculosis and its relationship to the varying degree of ionization of the atmosphere, and mentions the effect of the latter upon the autonomic nervous system.

IV. C. compared various aspects of tuberculous allergy and anaphylaxis in tuberculous g. pigs, by giving them two successive intradermal doses of tuberculin and horse serum respectively. The second dose in each case gave rise to the characteristic reaction which was similar in tuberculous allergy and anaphylaxis; though the latter was only of short duration and not always produced. Neither type of reaction was strictly specific. It was impossible to produce a durable desensitization to tuberculous allergy or to an anaphylactic local reaction by repeated injections.

C. had previously reported passive transmission of dermal anaphylactic reactions in rabbits, and now describes them in g. pigs, but this process was not successful with tuberculous allergy. [The author does not exclude a possibility of the latter occurring and, as it has been reported by several authors, he gives as explanation the hypothesis that antibodies which produce the local reaction only appear for a short period in the blood during the evolution of the sensitization].

V. Saenz has previously shown that the inoculation of g. pigs with dead mammalian strains of tubercle bacilli, coated in vaseline, causes a shortening of the pre-allergic period and an increase of the allergy. The experiments now described show similar results with dead avian tubercle bacilli, irrespective of whether " R " or " S " strains were used, but a dose about ten times as large was required in order to obtain an equal result. Only insignificant and delayed allergy was produced by killed avian strains of tubercle bacilli suspended in saline solution.

—C. V. Watkins.

I. Saenz, A. (1936). Réaction tuberculinique hémorragique particulièrement intense obtenue chez des cobayes par inoculation de bacilles tuberculeux morts enrobes dans l'huile de vaseline. [**Peculiarly Intense Haemorrhagic Tuberculous Reaction obtained in Guinea Pigs by Inoculation with Dead Tubercle Bacilli in Vaseline**].—*C. R. Soc. Biol. Paris.* **121.** 957-960. 2 figs. [3 refs.]

II. Lagrange, E., & Lagrange, M. T. (1936). Inoculation au cobaye de bacilles tuberculeux vivants incorporés à la lanoline ou au tapioca. [**Inoculation of Guinea Pigs with Living Tubercle Bacilli in Lanoline or Tapioca**]. —*Ibid.* 1575-1577. [1 ref.]

III. Bourgeois, P., & Boquet, Madeleine. (1936). Influence des hormones sexuelles et de la castration sur l'évolution de la tuberculose expérimentale du cobaye. [**Influence of Female Sex Hormones and Castration on Development of Experimental Tuberculosis**].—*Ibid.* **122.** 369-370.

IV. Loukidis, E. (1936). Recherches sur l'existence d'une action toxique à

distance produite par de bacilles tuberculeux enfermés dans des sacs de collodion dans le péritoine du lapin. [**Remote Toxic Action of Tubercle Bacilli enclosed in Collodion Sacs in the Peritoneum of the Rabbit**].—*Ibid.* 520-521. [4 refs.]

V. MEYER, K. (1936). Sur la nature des anticorps tuberculeux. L'existence d'anticorps lipo-protéidiques. [**Tuberculous Antibodies. The Lipo-Protein Antibodies**].—*Ibid.* 1037-1038. [2 refs.]

I. Inoculation of g. pigs by subcutaneous, intratesticular and pulmonary routes, with dead bovine tubercle bacilli in vaseline, gave rise to an allergic state characterized by very intense tuberculin reactions, the markedly haemorrhagic character of which recalled the Sanarelli-Shwartzman phenomenon.

II. The inoculation of g. pigs with virulent human tubercle bacilli mixed with lanolin or tapioca proved to be harmless whether given intradermally or subcutaneously. No appreciable immunity was established to subsequent injections of the same bacilli emulsified in water.

III. Neither folliculin nor extract of the corpus luteum appeared to have any effect on the development of experimental tuberculosis in the g. pig. On the other hand, castration seemed to increase the resistance of the animals.

IV. Collodion capsules containing 5 mg. of living tubercle bacilli emulsified in saline, were inserted into the peritoneal cavity of rabbits. Bovine, avian, human and atypical strains were used. The animals were killed eight months later and *post-mortem* examination failed to reveal any sign of the passage of any truly toxic substance through the walls of the sacs.

V. M. concludes that there exist, in anti-tuberculous serum, lipo-protein antibodies capable of reacting to either the lipoid antigens of the tubercle bacillus or the protein antigens.—A. ROBERTSON.

WALL, S. (1936). Om agglutinationsvärdet 10 och dess betydelse för serologisk diagnos av sjukdomen smittsam kastning hos nötkreatur. [**Significance of the Titre of Serum in Agglutination Tests for Bovine Contagious Abortion**]. —*Skand. VetTidskr.* **26.** 413-455. 1 fig., 12 tables. [English summary].

W. gives numerous data of great value in the problem of the control of bovine brucellosis and makes proposals for suitable methods. The paper and its many tables ought to be consulted. The items dealt with are as follows :– (1) agglutination values : W. uses the values 0, 10, 20, 50 and 100, 10 signifying aggl. using 0·1 c.c. of serum, 100 = aggl. with 0·01 c.c. and so on ; (2) aggl. values in a freshly infected herd ; (3) aggl. values in herds infected for years ; (4) aggl. values after live vaccination ; (5) corresponding aggl. and C.F. reaction values ; (6) significance of aggl. values ; (7) relation between blood aggl. values and infection of milk ; (8) aggl. values and infection of the placenta, and (9) control policy for newly and for old-infected herds.

The aggl. value 10 is important : it may indicate a freshly infected cow or one which has passed through infection. When testing a new herd, a waiting policy must be used, and the trend of aggl. values shows the state of the infection in the herd. If newly infected, the aggl. values rise and it is advisable to remove the high-titre reactors and to vaccinate non-reactors with dead vaccine, as it has been shown that agglutinins disappear (within three months) more rapidly in vaccinated beasts than in untreated ones that have become infected naturally. —J. E.

BACHRACH, M. D., & BRISKIN, N. I. (1936). Reakcija Wildbolz'a pri brucelleze kr. rog. skota. [**Wildbolz' Reaction in Brucella Infection in Cattle**].—*Sovyet. Vet.* No. 4. pp. 67-69. 5 tables.

The authors compared the blood agglutination test (A), the intradermal (abortin) test (B), and the Wildbolz test (C), the latter depending upon the injection of concentrated sterilized urine from suspected cows. Of 69 cows tested, 10 reacted positively to A, 52 to B and 15 to C; 12 were doubtful to A, 7 to B and 18 to C; 47 were negative to A, 10 to B and 36 to C. The authors consider that the results with C are worth following up.

I. Stuart, C. A., Fulton, MacD., Ash, R. P., & Gregory, K. K. (1936). **The Relations between Certain Heterophile Antibodies and Antigens.**—*J. infect. Dis.* **59.** 65-71. 3 tables. [Numerous refs.]

II. Heidelberger, M., & Kendall, F. E. (1936). **Quantitative Studies on Antibody Purification. I. The Dissociation of Precipitates Formed by Pneumococcus Specific Polysaccharides and Homologous Antibodies.**—*J. exp. Med.* **64.** 161-172. 2 tables. [18 refs.]

III. Fox, J. P. (1936). **The Permeability of the Lungs to Antibodies.**—*J. Immunol.* **31.** 7-23. 7 tables. [Numerous refs.]

IV. Meyer, K. (1936). Sur des anticorps à affinités multiples. [**Antibodies with Multiple Affinities**].—*Ann. Inst. Pasteur.* **56.** 684-699. 8 tables. [11 refs.]

I. After adsorption by human, ox and rabbit red corpuscles and g. pig kidney, samples of normal serum, of serum from cases of infectious mononucleosis and serum sickness, and of serum from rabbits immunized to human red corpuscles of group A, were tested with sheep corpuscles for the presence of agglutinins and lysins. The agglutinins and lysins were partially or completely removed from anti-A serum by A red corpuscles and by g. pig kidney, from normal serum by g. pig kidney only, and from infectious mononucleosis serum by ox red corpuscles only. Agglutinins for sheep red corpuscles were removed from the sera from cases of serum sickness by g. pig kidney and by both ox and rabbit red corpuscles, but the removal of lysins by ox and rabbit corpuscles was incomplete.

The cardinal character of heterophile antibodies is their ability to react with sheep corpuscles. Sheep heterophile antigen is composed of various fractions, all of which are present in the sheep corpuscle and, with the exception of the fraction characterizing infectious mononucleosis, also in g. pig kidney.

II. Quantitative studies were made of the effects of changes in pH, and of strong NaCl solution, upon polysaccharide precipitates obtained at low salt concentrations from Types I and II antipneumococcus horse sera and from Type III antipneumococcus rabbit sera. Details are given of a procedure whereby it was possible to obtain at a single step, from unconcentrated sera, antibody solutions, of which 85 to 93% of the total nitrogen was "immune nitrogen". By means of barium hydroxide and barium chloride, it was possible to dissociate precipitates which had been subjected to several successive salt dissociations. Analytical data are given of antibody of over 80% purity.

III. Normal lung is only slightly permeable to antibodies, whatever their type, when administered by the intratracheal route. This conclusion followed titrations of serum and of extracts of lung from rabbits and dogs that had received intratracheal injections of haemolytic antiserum, of Type I antipneumococcus serum, and of *Salmonella typhi* and *S. paratyphi* agglutinating sera. More direct evidence was obtained by the injection (intraven.) of living virulent Type I pneumococci into rabbits that had been given antipneumococcal serum intratracheally 24 hours previously.

The degree of permeability was not substantially different, whether the antibodies were contained in homologous or in heterologous serum, nor was permea-

bility significantly altered by pulmonary inflammation induced by sterile starch-aleuronate suspension in normal saline. On the contrary, antibodies were retained in the lung over a lengthy period, which suggests that, in pulmonary diseases amenable to serum therapy, the intratracheal administration of small doses of serum may be of greater value than the injection (intraven.) of much larger amounts.

IV. Comparative absorption tests, carried out with haemolysins of the Forssman type, produced in rabbits by immunization with *Bact. dysenteriae* (*Shigella dysenteriae*) and by the injection of human red corpuscles of group A, indicated that antibodies of these types possessed two distinct combining affinities, namely, one for Forssman antigen and another for the group or the specific antigen. Such antibodies are solidly fixed by the homologous antigen, inasmuch as the antibody-antigen complex is dissociated either not at all or to a negligible degree by heat at 60°C. In that respect antibodies of these types differ from ordinary Forssman haemolysins and from ordinary agglutinins, both of which form a reversible complex with the homologous antigen. Such extraordinary fixation of antibody to antigen is most simply and most satisfactorily explained by the assumption that it depends upon the existence in the antibody of two separate combining affinities.—J. W. Emslie.

Kobusiewicz, T. (1936). Masowe uodpornienie koni w wojsku przeciw tężcowi anatoksyną tężcową. **[Immunization of Polish Army Horses with Tetanus Anatoxin].**—*Biul. Sekc. weteryn.* **7.** 159-176. 9 tables. [11 refs.] [German summary].

35,512 horses belonging to the Polish army have been immunized with tetanus anatoxin since 1934. The process of immunization consists of three consecutive injections (subcut.) in the neck of 10 c.c. of anatoxin combined with tapioca, the second a month after the first, and the third a year after the second. The immunization campaign begins in October and ends in May, as the Polish army manoeuvres take place in the summer and the horses bear immunization better in the cold than in the warm weather. [No results given].—A. Szwabowicz (Lwów).

Schütze, H., Gorer, P. A., & Finlayson, M. H. (1936). **The Resistance of Four Mouse Lines to Bacterial Infection.**—*J. Hyg., Camb.* **36.** 37-49. 10 figs., 9 tables. [7 refs.]

A comparison was made between two mice lines known to be resistant and non-resistant respectively to salmonella infection, and two fresh mice lines, a resistant and a non-resistant, regarding their resistance to infection with an organism of the salmonella group, an organism of the pasteurella group, a pneumococcus and the virus of " louping ill ". These mice lines only showed typical resistance and non-resistance when the salmonella organism was used. The two resistant strains were shown to possess the power either of bactericidal action, or of inhibiting bacterial growth. The sera of mice of the known resistant strain, which had received inoculations of dead salmonella vaccine, showed a higher H agglutination titre than those of the two similarly treated non-resistant strains. —P. L. S.

DISEASES, GENERAL.

McKinley, E. B. (1935). **A Geography of Disease. A Preliminary Survey of the Incidence and Distribution of Tropical and Other Diseases.** pp. xxv + 495. Numerous tables, 1 appendix. Suppl. to *Amer. J. trop. Med.* **15.**

No. 5. Washington, D. C.: The George Washington Univ. Press. [4to].

This is pioneer work in medical literature and gives a broad idea of the incidence of the tropical diseases of mankind.

The diseases present in each country are described briefly in general terms, and are listed in accordance with the results of a standard questionnaire. The survey covers all tropical and subtropical countries, which are dealt with in geographical groups, and at the end there are contributed very short articles on 18 important diseases, giving their history and world importance. The book is a splendid reference volume, and of the great use to veterinarians interested in comparative pathology.—J. E.

EDWARDS, S. J. (1936). **Biennial Reviews of the Progress of Dairy Science. Section E. The Diseases of Dairy Cattle. I. Mastitis. II. Contagious Abortion. III. Tuberculosis.**—*J. Dairy Res.* **7.** 291-318. [Numerous refs.]

This valuable review extends over many years up to and including 1935. Mastitis is discussed under bacteriology, pathogenesis, diagnosis and control; contagious abortion under pathogenesis, *Brucella abortus* in milk, the brucella group, diagnosis, immunization and control; and tuberculosis under avian infection in cattle, bovine infection of milk, diagnosis, immunization and eradication.—J. E.

ANDRIJEWSKI, P. (1936). Uwagi ogólne do studjów w zakresie chorób zakaźnych. [**Control of Infectious Diseases**].—*Wiad. weteryn.* **15.** 303-323. [Numerous refs.] [French summary].

A. discusses the organization of infectious disease control, debating the value of enlisting the help of agricultural bodies and the medical profession.

—A. SZWABOWICZ (Lwów).

CHRISTIANSEN, M. (1935-1936). De vigtigste smitsomme Sygdomme hos Vildtet. [**Important Diseases of Game Animals**].—*Maanedsskr. Dyrlaeg.* **47.** 353-368, 392-403, 449-463, 481-491, 509-517, 539-551 and 570-582. 28 figs. [Numerous refs.]

In this general survey special attention is given to the diseases found on the examination of a great number of game animals from all parts of Denmark sent to the laboratory for *post-mortem* examination.

HARES.—*Pasteurella pseudotuberculosis rodentium* infection is the most important disease; it appears in greater and smaller epizootics and the mortality is high. Tularaemia has never been demonstrated. Pasteurellosis is found in a few cases. Pyaemia due to *Staph. pyogenes* is common. Coccidiosis is of great importance as it is specially fatal to young animals. No liver lesions were found. A stomach-worm (*Trichostrongylus retortaeformis*) is very common, and sometimes causes death. *Trichuris leporis*, *Cittotaenia pectinata* and *Cysticercus pisiformis* are found.

DEER.—Roe deer and red deer are sometimes affected with tuberculosis (bovine type). *Fasciola hepatica* sometimes causes severe illness and death. *Cephenomya stimulator* is found in certain districts. Among the ectoparasites encountered are *Ixodes ricinus* and *Lipoptena cervi* which are often seen. The lung worm *Dictyocaulus viviparus* is very common and is often present in sufficient numbers to cause lesions. *Onchocerca flexuosa* is found in red deer from a certain district. *Cysticercus tenuicollis* and *C. cervi* are also found.

INFECTIONS OF GAME BIRDS.—Pheasants for the most part come from certain breeding centres, and, owing to the artificial conditions, tuberculosis is fairly frequent. Pneumonomycosis (*Aspergillus fumigatus* infection) is met with. In wood-pigeons (*Columba palumbus* L.), infection with *Past. pseudotuberculosis*

rodentium causes pseudotuberculosis. Epithelioma contagiosum is often present in partridges and wood-pigeons, less frequently in pheasants, and always with cutaneous lesions. There is a high mortality in wood-pigeons in which typical lesions in the throat and oesophagus are present. Coccidiosis is of some importance in pheasants. *Syngamus trachea* is common. Among the nematodes found in pheasants are *Heterakis*, *Capillaria*, *Echinuria* and *Tropisuris*, which are common parasites in wild birds.—H. C. Bendixen (Copenhagen).

Wall, S. (1936). En översikt av sjukdomar hos höns. [**Review on Fowl Diseases in Sweden**].—*Skand. VetTidskr.* **26.** 477-497. [English summary].

W. gives an account of 4,419 *post-mortem* examinations carried out on poultry at the State Veterinary Bacteriological Institute from January, 1925, to June, 1935. The diseases causing the greatest losses were: leucosis in 9 % of the cases examined; *Salmonella pullorum* infection in 13 %; inflammation of the oviduct in 10 %; tuberculosis in 4 %; coccidiosis in 19 %, and gout in 6 %. *S. pullorum* infection and coccidiosis mainly affected chickens. Leucosis, tuberculosis, inflammation of the oviduct and gout chiefly occurred in mature fowls.—H. B. (Stockholm).

Johnen, F. L. (1936). Die Sterilitätsbekämpfung in der Rheinprovinz bei Stuten unter Hinzuziehung der praktischen Tierärzte. [**Campaign against Sterility in Mares in the Rhine Province**].—*Dtsch. Tierärztebl.* **3.** 200-202.

In Germany sterility in mares has been dealt with as a matter of national importance. J. is in charge of the campaign in the Rhine province, and he describes what has been done during the past two years.

Costs for veterinary attendance and laboratory diagnostic work are defrayed by fixed charges on the studs. J. emphasizes the importance of the rectal examination of mares, stating that a definite diagnosis of pregnancy can always be made by the 49th day after service. He also gives details for treatment of metritis, etc.
—J. E.

Anderle, R., & Eberle, J. (1936). Masowe pojawienie się ślepoty miesięcznej u koni, które przebyly influencę. [**Periodic Ophthalmia in Horses after Influenza**].—*Biul. Sekc. weteryn.* **7.** 95-114. [6 refs.] [German summary].

From 1930 to 1934, A. and E. observed 23 cases of periodic ophthalmia in horses. Of these, 17 had, eight months before, suffered from influenza. A. and E. suggest that there is an aetiological connexion between these diseases.
—A. Szwabowicz (Lwów).

Creech, G. T., & Gochenour, W. S. (1936). **Chronic Progressive Pneumonia of Sheep, with Particular Reference to its Etiology and Transmission.**—*J. agric. Res.* **52.** 667-679. 6 figs., 1 table. [8 refs.]

Chronic progressive pneumonia of sheep occurs in the north-western regions of the United States, and is generally considered by those who have studied the condition to be identical with that known as "jagziekte" in South Africa. In both conditions adenoma-like proliferations of the lung epithelium occur.

C. and G. examined 23 sheep affected with the disease, and carried out histological and bacteriological examinations. No organisms which could be considered to be of significance were isolated from the lungs of affected sheep.

Using 96 healthy sheep, attempts were made to transmit the disease: emulsions of lung tissue, blood, organisms isolated from the lung, etc. were inoculated by various routes into healthy animals (intrapulmonary, intravenous, subcutaneous, intratracheal injections and feeding). Contact with affected animals was also tried.

Four of the experimental animals developed a condition which in its gross and histological characters resembled chronic progressive pneumonia. Three of these animals had received intrapulmonary inoculations and the fourth intravenous inoculation of emulsified lung tissue. Attempts to transmit the disease by the inoculation of material from these animals were unsuccessful. Conclusive evidence of the transmission of the disease was, therefore, not obtained.

[A similar condition was described by M'Fadyean under the title "Transformation of the Alveolar Epithelium in Verminous Pneumonia in the Sheep"—(1920). *J. comp. Path.* **33.** 1. The affected areas of lung tissue, however, contained no worms and none of the illustrations include either eggs, larvae or adult worms. It may well be that the alveolar and bronchial epithelium of the sheep lung readily undergoes proliferation and metaplasia when subjected to chronic irritation by a variety of agents. A study of the histogenesis of the condition might well throw light on the question of the existence of an alveolar epithelial lining, a fundamental problem on which there is still no conclusive evidence].

—E. G. White.

Kudrjavcev, A., Koudrjašov, M., & Trojanovskij, D. (1935). K charakteristike rasstrojstv piśćevaritelnich funkcij u porosjat. [**Digestive Disorders in Piglets**].—*Trud. vsesojuz. Inst. eksp. Vet.* **10.** 33-40. 7 tables. [Numerous refs.] [French summary].

The authors, with a view to developing improved prophylactic and therapeutic methods against piglet diarrhoea, studied (for from 6 to 14 days) nine piglets (from 5 to 30 days old) in which gastric and gall-bladder fistulae had been made. Data of the cases are given in tabular form (duration of observation, quantity per hour of gastric juice secreted, acid content of the gastric juice, its pH, its curdling action on milk, and its digestive action on albumin [Mette's method]). The authors concluded, on the basis of their data, that diarrhoea in piglets is caused by deficiency in gastric secretion. Lactic acid was found to stop the diarrhoea when administered in two doses of 1 c.c. or in one dose of 2 c.c. A dose of 0·5 c.c. was ineffective.

I. Lombard, C. (1936). Cancer expérimental et néoplasies expérimentales. [**Experimental Cancers and Other Neoplasms**].—*Rev. vét., Toulouse.* **88.** 305-346. 5 figs.

II. Valade, P., & Quarante, A. (1936). Cancer de la conjunctive du boeuf. [**Cancer of the Conjunctiva in Cattle**].—*Rec. Méd. vét.* **112.** 129-139. 7 figs. [6 refs.]

I. Past efforts and present knowledge are discussed in this review of experimental cancers and neoplasms. The first section deals with attempts to graft portions of existing tumours into animals of homologous or heterologous species, and the power of growth, variations and modifications of the tumours thus grafted are considered. The second section deals with "provoked" growths, and these are classified according to their cause. The inoculation of embryonic tissues, mechanical injury, physical agents such as heat, cold, Röntgen and other rays, chemical agents and parasitic or microbial agents are all factors by means of which growths can be induced. Of the chemicals, soot, tar and orthoamidoazotoluol are the most effective, and the nature of the tar tumours and the importance of the presence of benzopyrine are indicated. The parasitic or microbial group includes those tumours such as the Rous sarcoma, the Shope papilloma and the rabbit myxoma, which are due to viruses or, at least, are transmissible in series by filtrate inoculation. The aetiology and proper classification of these filtrable virus types

are discussed. The article is full of references to published work, and it is to be regretted that no bibliography is given.

II. Twenty-one cases of conjunctival tumours in cattle were received from one country region. Histological study showed 15 of these to be epitheliomata, one to be an epithelio-sarcoma, one a spindle-celled sarcoma and four to be papillomata. The spindle-celled sarcoma, the epithelio-sarcoma, and one epithelioma are described in detail and are shown in photomicrographs and text figures.

V. and Q. suggest that the practice of tethering the animals at pasture by a chain round the horns is responsible for a chronic irritation of the ocular region which may result in neoplastic growth.—NORMAN HOLE.

JASON, M. (1936). Des réflexes vaso-dilatateurs fonctionnels. Troubles de la fonction hépatique. Son rôle dans l'interprétation de la pathogénie de la fièvre vitulaire et de la paraplégie hémoglobinurique. [**Vaso-Dilatory Reflexes and Liver Dysfunctions in Pathogenesis of Milk Fever and Equine Myohaemoglobinuria**].—*Ann. Méd. vét.* **81.** 261-268 and 289-298. [1 ref.]

J. expresses his opinions, which are of a highly hypothetical character, upon the aetiology of milk fever and equine haemoglobinuria. He appears to regard these conditions as, broadly speaking, similar in their pathology. He believes that in both affections the liver is in a state of hyperfunction, resulting from psychic excitement. There is depression of the parasympathetic mechanism, and J. suggests the use of such drugs as pilocarpine and arecoline in curative treatment. [He does not appear to be aware of the results of the extensive biochemical researches which have been made concerning these diseases].—J. R. GREIG.

I. FINCHER, M. G. (1936). **Clinical Observations in Acetonemia of Cattle.**—*Cornell Vet.* **26.** 142-158. [4 refs.]

II. SAMPSON, J., & HAYDEN, C. E. (1936). **Physiological Aspects of Ketosis in Cows and Ewes with Special Reference to Carbohydrate Metabolism.**—*Ibid.* 183-199. 2 figs., 4 tables. [Numerous refs.]

III. MOINE, G. (1936). Tétanie d'herbage et fièvre vitulaire. [**Grass Tetany and Milk Fever**].—*Rec. Méd. vét.* **112.** 211-213.

IV. MOINE, G. (1936). La tétanie chez les jeunes bovidés. [**Tetany in Young Cattle**].—*Ibid.* 398-404. [12 refs.]

V. BLAKEMORE, F., & STEWART, J. (1936). **Studies on the Magnesium Content of Cows in Lactation Tetany Districts.**—*Rep. Inst. Anim. Path. Univ. Camb. 1934-1935.* pp. 103-110. 5 tables. [2 refs.]

VI. ADAMSON, J., Jr. (1936). **Hypomagnesaemia – " Grass Staggers ".**—*Vet. Rec.* **48.** 818-819.

VII. METZGER, H. J. (1936). **A Case of Tetany with Hypomagnesemia in a Dairy Cow.**—*Cornell Vet.* **26.** 353-356. [3 refs.]

I. F. assumes that the following are synonyms for acetonaemia :– hypoglycaemia, ketosis, acetonuria, chronic milk fever and gastro-intestinal catarrh (in cattle); pregnancy disease, acidosis, stercoraemia, acute hepatitis and pregnancy toxaemia (in sheep). Brief descriptions of the aetiology and incidence of acetonaemia are given, the author having observed it in all dairy breeds, animals of all ages, at successive lactations, and in every month of the year. A classification of clinical symptoms based on the findings in several of the cases is given. It is concluded that most of the cases which occur within a few days of parturition are of the milk fever type and that the chief cause of the others is digestive or nervous trouble. Typical cases are described in detail. A short section dealing with the treatment

of acetonaemia stresses the value of dextrose (given either subcut. or intraven.) in that type of the disease which is not intimately associated with parturition.

II. The physiological significance of the ketosis present during the course of several diseases of cows and ewes has still to be discovered. In this paper an attempt is made to show that a relationship exists between the carbohydrate metabolism and this ketosis. Data are given from 35 cases in cows, and it is seen that an intense ketosis was usually associated with a hypoglycaemia, but that a moderate ketosis was not. Occasionally a hyperglycaemia was present. Treatment with glucose reduced the amount of ketone bodies in the blood. Contrary to the findings of other workers, a disturbance of the mineral content of the blood was not found. Similar results were obtained in the case of pregnancy toxaemia in the sheep, but the hypoglycaemia was less frequently found. In the case of pregnancy toxaemia, again, the acidosis present could not be related to deranged mineral metabolism. The authors conclude that ketosis is invariably associated with an upset of carbohydrate metabolism, both in the cow and the ewe, but the data given are too meagre to warrant any definite conclusions, especially since the disease entities grouped together under the loose heading of ketosis are so varied in their clinical symptoms and pathology.

III. The clinical picture and methods of treatment of four cases of milk fever, followed very quickly after recovery by a tetany closely resembling lactation tetany, are described. Attention is called to the extreme susceptibility of cows to this tetany when turned out to young grass too soon after recovery from typical milk fever, and also to the fact that milk fever is much more serious and quicker in onset if it occurs at the beginning of the grazing season than if it occurs at any other time. Since no biochemical findings are given, it is difficult to follow the theories of the author relating to hypocalcaemia and hyperguanidinaemia and the condition of tetany described.

IV. Cases of grass tetany in calves aged three months, ten days and two months are described from the clinical and therapeutic standpoints. The symptoms are similar to those found in cases of lactation tetany in cows, and the calves usually respond to Mg injections. The aetiology is discussed at length and the influence of diet as a primary factor is stressed. M. suggests that feeding a mixture of Ca and Mg during the winter months would be an ideal preventive measure, whilst the injection (intraven.) of Mg chloride and glucose is the best treatment for the condition.

V. In a previous paper by the authors it was shown that the blood of several members of herds in which cases of lactation tetany occurred had a very low Mg content, despite the fact that the animals were apparently normal. In the present paper data are given to show that in districts in Lincolnshire where lactation tetany is prevalent there is a drop in the Mg level of the blood of cows immediately after being put out to pasture in early spring, and that the period during which the amount of Mg in the blood is decreased coincides with the period during which most cases of the disease have been observed. No fall in blood Mg occurred in a control herd pastured in Essex, where the disease has never been diagnosed, and no correlation was obtained between the fall in blood Mg and the Mg content of the pasture. Experiments carried out on a farm in Lincolnshire revealed that the feeding of a mineral mixture containing 10% of Mg counteracted the fall in blood Mg occurring in early spring. The data, however, were insufficient to render possible the drawing of any conclusions regarding the prophylactic usefulness against lactation tetany of such a mineral mixture.

VI. This article describes outbreaks of lactation tetany in the Bolton district. No blood analyses were carried out, the condition being diagnosed from its clinical

picture. A. is of the opinion that a progressive decrease in rainfall was responsible for a big decrease in the number of cases during 1935 and 1936 as compared with the number in 1934. Ca injections were found to have little or no effect. 25 % of the cases responded to udder inflation and the administration of one to two ounces of chloral hydrate in a pint of water. A saline purge was usually given after the chloral.

VII. A case of typical grass staggers or lactation tetany in a Jersey cow aged between seven and eight years is described. It had not calved for two years but was subsequently proved to have been seven months pregnant at the time of the onset of the tetany symptoms. The cow was found lying in a field of early spring pasture and the injection (intraven.) of calcium borogluconate and the injection (subcut.) of glucose had no effect. Twenty-four hours later the administration of Ca and Mg chloride brought instant relief and, in order to cure a possible anhydraemia, from 2 to 3 gallons of water and 4 oz. of sodium chloride were given. Two hours later the cow was found wandering round the pasture and eventually it completely recovered. A blood sample taken whilst the animal was lying down showed that the blood Mg was 0·145 mg. and the blood calcium 7·5 mg. per cent.
—James Stewart.

Norway. (1936). Offisielle bekjentgjørelser. Smittsom hønselammelse. [**Order on Infectious Fowl Paralysis**].—*Norsk VetTidsskr.* **48.** 314-317.

By virtue of the Diseases of Animals Act of 1894 and its Amendments, this Royal Order provides that " infectious fowl paralysis " shall be included in the list of milder contagious animal diseases. The general provisions are compulsory notification, the whole flock being looked upon as infected, the fencing in of the flock, prohibition of the movement or of the sale of fowls or laying-eggs from the farm, and the burial or destruction of carcasses of affected birds.

In connexion with the order, the Ministry of Agriculture adds a general description of the disease and gives prescriptions for cleaning and disinfecting fowl-houses and implements. [It is to be noted that the disease is considered to be " infectious "].—Gustav Naerland (Oslo).

Anon. (1936). **The Influence of Diet on Caries in Children's Teeth.**—*Spec. Rep. Ser. med. Res. Coun., Lond.* No. 211. pp. 137 + xii. 8 figs., numerous tables. [Numerous refs.] London : H.M. Stat. Off. [8vo] [2s.]

Anon. (1936). **The Relation of Diet to Dental Caries.**—*Lancet.* **231.** 280-282. [1 ref.]

Anon. (1936). **Vitamin D and the Teeth.**—*Ibid.* 266. [1 ref.]

To the basal diets of three groups of children living an institutional life, daily measured quantities of treacle, olive oil or cod liver oil were added. In a second series two random groups in the same institution were given olive oil or olive oil with the addition of irradiated ergosterol. In yet a third series, children under five years old were studied in relation to the role of vitamin D in determining the structure of their teeth. The resulting data for the development and arrest of dental caries are subjected to very careful analysis in all groups. The general conclusions were as follows:– the investigations described in this report show conclusively that a relatively high vitamin D content of the food can do much to diminish the incidence of caries if the vitamin is given during the development of the teeth ; that a beneficial effect may be obtained if the vitamin is given at a fairly late stage of development ; and that even when it is given after the eruption of the teeth, the onset and spread of caries is delayed.—S. J. Edwards.

PUBLIC HEALTH.

I. HEISS, K. (1936). Ueber das Auftreten eosinophiler Leukozyten in der Milch. [**Eosinophile Leucocytes in Milk**].—*Z. Fleisch- u. Milchhyg.* **46.** 438-443. 2 figs., 6 tables. [Numerous refs.]

II. KUHN, E. (1936). Ueber den bakteriologischen Nachweis von Eiter und Galtstreptokokken in roher und erhitzter Milch. [**Demonstration of Pus and Mastitis Streptococci in Raw and Heated Milk**].—*Ibid.* 443-444.

I. H. first discusses the theories regarding the origin of eosinophile leucocytes in milk. In a study of the variation in their numbers, it was found that there was an increase at the beginning and at the end of lactation, and also when the cows were at pasture. There was no correlation between increased numbers of eosinophiles and the presence of chronic mastitis.

II. For the microscopic demonstration of cells and streptococci in milk it was found to be an advantage to heat the milk, before centrifuging, to a temperature of from 60° to 70°C. A higher temperature precipitated albumin, which rendered the cell picture less distinct.—S. J. EDWARDS.

STALHAMMAR, H. (1936). Bidrag till metodiken vid bakteriologisk undersökning av handelsmjölk. [**Bacteriological Milk Inspection**].—*Skand. Vet Tidskr.* **26.** 515-519. [English summary].

S. discusses a method for the bacteriological examination of milk suggested by GUSTAFSON, and recommends a modification. Centrifuged sediment is sown on to media and cultivated both aerobically and anaerobically.

—GUSTAV NAERLAND (OSLO).

I. BREIDERT. (1936). Melkfette desinfizierten nicht ! [**"Milker's Ointments" do not Disinfect**].—*Berl. tierärztl. Wschr.* **52.** 150.

II. SCHMIDT-HOENSDORF, SCHÜNEMANN, & HUNDHAMMER. (1936). Desinfektionsversuche mit Weidnerit-Gel und mit Melkfetten in der Praxis. [**Disinfection Treatment with "Weidnerit-Gel" and "Milker's Ointments"**].—*Ibid.* 505-506. 3 tables.

III. BREIDERT. (1936). Melkfette sind Infektionsquellen. [**"Milker's Ointments" as Carriers of Infection**].—*Münch. tierärztl. Wschr.* **87.** 145-146. [Numerous refs.]

IV. SCHMIDT, W. (1936). Vergleichende Laboratoriums-untersuchungen über die Desinfektionswirkung des Weidnerit-Gel und einiger osmaronhaltiger Melkfette auf Mastitis-Streptokokken. [**Disinfectant Action of "Weidnerit-Gel" and Some "Milker's Ointments" on Mastitis Streptococci**].—*Tierärztl. Rdsch.* **42.** 728-730. 2 tables. [8 refs.]

V. SEELEMANN, M. (1936). Ueber Melkfette und ihre Bedeutung im Kampfe gegen die Euterinfektionen. [**Importance of "Milker's Ointments" in Mastitis Control**].—*Ibid.* 285-287 and 299-306. 4 tables. [4 refs.]

I. B. contends that "milker's ointments" are of no practical value for the control of streptococcal mastitis. No experimental evidence is presented but recent reports of other investigators are reviewed very briefly. It is emphasized that laboratory experiments with these ointments have but little bearing upon field conditions. In any case, an ointment which under experimental conditions requires to be in contact with streptococci for one hour before destroying them is obviously worthless in the field.

II. "Weidnerit-gel" is considerably more efficient than other varieties of "milker's ointments" from the point of view of the destruction of mastitis streptococci.

It is emphasized that the value of such ointments cannot be assessed by ordinary *in vitro* tests. The only time to test ointments is when they are spread in a thin layer on the teat of a cow. In this condition they are completely exposed to influences likely to destroy their disinfectant effect, such as oxidation, the alkalinizing effect of ammonia vapour rising from the bedding, the alkalinizing effect of the natural body-fats, etc.

III. Infection can be propagated by milkers who put their milk-soiled hands into the ointment pot. In this case the ointment becomes contaminated with mastitis milk and infection is transferred thence to other cows.

IV. The superiority of " weidnerit-gel " over other " milker's ointments " is confirmed by laboratory experiment. No field tests are reported.

V. The ability of various commercial " milker's ointments " to kill streptococci and other udder pathogens has been investigated. With the exception of " weidnerit-gel ", which destroyed mastitis streptococci within a minute, none of the preparations showed any rapid destructive action. The incorporation of other disinfectants in these ointments improved their destructive action considerably. When " weidnerit-gel " was submitted to practical test by use on three large dairy herds, no significant difference was found between the incidence of mastitis amongst cows regularly treated with ointment and untreated controls. If mastitis is to be held in check cows must always be milked right out, milk must not be spilt on the bedding, wet milking must not be practised, but ointments must be used freely as lubricants, the milkers must wash their hands frequently during milking, and cows with diseased udders must be milked last.—E. J. PULLINGER.

QUAEDVLIEG, E. J. A. A. (1936). Le traitement des cadavres et des produits d'origine animale au point de vue de la prophylaxie vétérinaire et projet de réglementation. [**Treatment of Carcasses and Meat Products from the Legal and Prophylactic Standpoint**].—*Bull. Off. internat. Epiz.* **12.** 17-53. Discussion pp. 516-532. 7 figs., 1 table, 10 graphs.

FLÜCKIGER, G. (1936). Le traitement des cadavres et des produits d'origine animale au point de vue de la prophylaxie vétérinaire et projet de réglementation. [**Treatment of Carcasses and Meat Products from the Prophylactic and Legal Standpoint**].—*Ibid.* 59-83. Discussion pp. 516-532. 6 figs.

These two papers describe the different methods adopted in various countries for the disposal of dead animals, with the laws and regulations relating thereto.

The transport of the carcasses to the knackeries is effected without any bloodletting, skinning or evisceration. The types of vehicle employed for this purpose are shown on good plates.

In some countries, *e.g.*, Denmark, knackeries are established in certain areas, and not only animals which have been found dead but waste material from private abattoirs are sent to them. These knackeries are conducted on the co-operative principle, and the by-products are sold to farmers in the form of meat and bone meals for feeding purposes, or as manure. Such a system of disposal is preferable to burying or burning ; it is less expensive and the residue is of considerable commercial value.—T. DUNLOP YOUNG.

LEONHARDT, L. (1936). Ueber eine Massenerkrankung an bakterieller Lebenmittelvergiftung. Entenei und *Bac. enteritidis* Breslau. [**An Outbreak of Food Poisoning due to Bacteria. Ducks' Eggs**].—*Offentl. GesundhDienst.* **2.** 9-12. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 650. Signed W. G. SAVAGE].

The author gives particulars of an outbreak of food poisoning of 66 cases

with 6 deaths. All started with severe diarrhoea and vomiting following shivering and fever. Some, however, ran a prolonged course closely resembling typhoid fever. The incubation period in most cases was 6–12 hours. All the sufferers had eaten on July 29th the same mid-day meal at an hotel. The vehicle of infection was a pineapple preparation which contained ducks' eggs, and everyone who ate this food was ill. From the excreta of cases, the spleen of one of the patients who died, from the pineapple food and from one duck's egg, the same bacillus was isolated. The author describes it as *Bac. Breslau* but not typical as regards its agglutination characters [obviously a Salmonella strain but not fully identified by the agglutination tests quoted]. There were two cases of contact infection, guests at the same hotel. In the prolonged infections blood examinations were negative.

THERAPEUTICS AND MATERIA MEDICA.

I. Scheff, G., & Hasskó, A. (1936). Einfluss einiger Chemotherapeutika auf den Stoffwechsel der Trypanosomen, mit Rücksicht auf das Interferenzphänomen. [**Influence of Drugs on Metabolism of Trypanosomes, with Reference to Interference Phenomenon**].—*Zlb. Bakt. I. (Orig.).* **136.** 420-424. 2 tables. [6 refs.]

II. Dubois, A. (1936). Essai d'obtention d'une souche atoxyl-résistante au moyen d'un produit aromatique non arsénical et non trypanocide. [**Attempt to Obtain an Atoxyl-Resistant Strain of Trypanosome by Means of a Non-Trypanocidal Aromatic Product**].—*Ann. Soc. belge Méd. trop.* **16.** 165-172. 1 table. [10 refs.]

III. Zolog, M., & Comsia, O. (1936). Nouvelles recherches sur l'action des substances arsénobenzoliques dans les trypanosomes expérimentales. [**Arsenobenzol in Experimental Trypanosomiasis**].—*C. R. Soc. Biol. Paris.* **122.** 1132-1134. [1 ref.]

IV. Dubois, A. (1936). La résistance des trypanosomes aux arsénicaux aromatiques s'étend à d'autres produits aromatiques non-arsenicaux. [**Resistance of Trypanosomes to Aromatic Arsenical and Non-Arsenical Products**].—*Ann. Soc. belge Méd. trop.* **16.** 173-176. 1 table. [1 ref.]

I. Parafuchsin, " trypaflavine " and " neosalvarsan " inhibit the oxygen and sugar consumption of flagellates ; parafuchsin has a much less powerful action than the other two substances. The sugar metabolism is inhibited before the oxygen consumption. Parafuchsin and sodium thioglycolate protect trypanosomes against the inhibitory action of " trypaflavine " and " neosalvarsan." It is concluded that storage of dye and therapeutic action are not identical.

II. It has not been possible to produce an atoxyl-resistant strain of trypanosome by repeated injections of paraminobenzoic acid (duration of experiments = 4 months, involving 25 passages in mice and 82 injections).

III. Experiments on organisms introduced in collodion sacs into the peritoneum of rats subsequently treated show that toxalbumen cannot be the active factor in the action of arsenobenzol. Reduction of the drug in the organism is not an essential preliminary to its action.

IV. The finding of Yorke *et al.*, *viz* that *Tryp. rhodesiense*, made resistant to atoxyl, is also resistant to non-arsenical aromatic compounds (" stibenyl-trypaflavine ") has been confirmed for other species of trypanosomes. It also seems to hold for spontaneously occurring resistance though no definite conclusion is made in the case of *Tryp. gambiense* in the g. pig.—J. M. Robson.

I. Yakimoff, W. L., Gousseff, W. F., & Stepanoff, J. G. (1936). Essais de traitement des piroplasmoses des bovidés du sud de la Russie (U.R.S.S.) avec différents produits chimiothérapeutiques. [**Treatment of Bovine Piroplasmosis in the South of the U.S.S.R. with Chemical Products**].—*Ann. Soc. belge Méd. trop.* **16.** 293-297. 2 tables.

II. Yakimoff, W. L., Nezwetaieff, N. W., & Yakowleff. (1936). Die Behandlung der Rindertheileriose (Theileria annulata) mit Todorit. [**Treatment of** *Th. annulata* **Infection in Cattle with " Todorit "**].—*Tierärztl. Rdsch.* **42.** 269-271. [4 refs.]

III. Yakimoff, W. L., Rastegaieff, E. F., & Soussko, S. F. (1936). Zur Frage der Trypaflavinwirkung auf die Pferdenuttalliose. [**Chemotherapy of Equine Piroplasmosis with " Trypaflavine "**].—*Berl. tierärztl. Wschr.* **52.** 439-442.

I. 96 animals were treated with different chemotherapeutic substances. The most constantly satisfactory results were obtained with " ichthargan " and " todorit ". The former was given in doses of from 1 to 2·5 g. though a dose of 1 g. was usually insufficient. " Todorit " was injected intramuscularly in doses of 10 c.c. per 250 kg. and the dose was occasionally repeated. The piroplasms concerned are those mentioned below.

II. " Todorit " exerts a specific action not only on infections with *Babesia bovis* and with " *Françaiella colchica*," " *Fr. caucasica*" and " *Fr. occidentalis*," but also in *Theileria annulata* infections. From 10 to 12 c.c. of " todorit " was given intramuscularly or subcutaneously and the dose was repeated in some cases.

III. Experiments were performed on four animals, inoculated with *B. equi*. " Trypaflavine " and " ichthargan " have an antipyretic and an antiparasitic action. Further experiments are necessary to determine whether " albargin " is effective.

J. M. Robson.

Corenzwit, H. M. (1935). **Experiments Leading to an Effective Treatment for Canine Whipworms.**—*J. Amer. vet. med. Ass.* **87.** 661-679. 8 tables. [5 refs.]

C. believes that much harm is caused to dogs by the presence of the whipworm, *Trichuris depressiusculus*, in the caecum. Having found that excision of the caecum was not popular with clients, he proceeded to perfect a technique for the injection of anthelmintics directly into the caecum. This he was able to do by passing a glass tube *per rectum*, and sliding a rubber tube through the glass one in a particular way which he describes in detail. Several anthelmintics were tried and nicotine sulphate was found to be the best. A dose of 0·7 of a grain was found to be effective in 75 % of cases. Great improvement in condition is said to have been observed in some of the treated dogs. [Worms belonging to the genus *Trichuris* are generally considered to be among the most harmless of intestinal parasites].—E. L. Taylor.

Mönnig, H. O. (1936). **Carbon-Tetrachloride and Tetra-Chlorethylene for Worms in Animals.**—*Fmg S. Afr.* **11.** 239.

A description is given of the methods of dosing the different species of domesticated animals for bloodsucking worms. The susceptibility of the different animal species to the drugs is discussed. Tetrachlorethylene appears to be less harmful than carbon tetrachloride, but the greatest care should be taken when using either drug, particularly in sheep. Tetrachlorethylene appears to be of little use for liver fluke infestation.—E. M. Robinson.

I. Sasano, K. T., & Medlar, E. M. (1936). **The Bactericidal and Biological Properties of Phenyl Mercuric Subnitrate.**—*J. infect. Dis.* **59.** 35-39. 6 tables. [6 refs.]

II. Morel, A., Rochaix, A., Perrot, L., & Pegon, A. (1936). Sur le pouvoir infertilisant de nouveaux dérivés de la 8-hydroxyquinoléine vis-à-vis des cultures de quelques microbes pathogènes. [**Antiseptic Action of New Derivatives of 8-Hydroxyquinoline on Cultures of Certain Pathogenic Bacteria**].—*C. R. Soc. Biol. Paris.* **122.** 1115-1116. [3 refs.]

III. Morel, A., Rochaix, A., Perrot, L., & Moutou, M. (1936). Pouvoir infertilisant de deux dérivés de la 6-méthyl-8-hydroxyquinoléine vis-à-vis de quelques microbes pathogènes. [**Antiseptic Action of Two Derivatives of 6-Methyl-8-Hydroxyquinoline on Certain Pathogenic Bacteria**].—*Ibid.* 1113-1114. [3 refs.]

IV. Lévy-Bruhl, M., & Cado, Yvonne. (1936). Pouvoir antiseptique et bactéricide du diacétyle vis-à-vis de quelques microbes pathogènes. [**The Antiseptic and Bactericidal Power of Diacetyl on Certain Pathogenic Bacteria**].—*Ibid.* 373-374. [2 refs.]

V. Bayliss, M. (1936). **Effect of the Chemical Constitution of Soaps upon their Germicidal Properties.**—*J. Bact.* **31.** 489-504. 4 tables. [19 refs.]

I. Phenyl mercuric subnitrate kills tubercle bacilli (human and bovine) exposed to a 1 : 15,000 concentration of the drug for 30 minutes. Bacteria killed by phenyl mercuric subnitrate are somewhat more potent as antigens than similar bacteria killed by heat. The drug does not coagulate or precipitate serum and does not interfere with complement-fixation tests. 10 c.c. of a 1 : 1,500 solution injected (intraven.) occasionally produced a rather severe local inflammation at the site of injection without any apparent systemic reaction.

II. The following have a significant antiseptic action on pathogenic bacteria :– the neutral sulphate (sunoxol), the salicylate, the sulphosalicylate which has a higher solubility, and the hydrochloride of 6-methyl-8-hydroxyquinoline.

III. The hydrochloride has a high antiseptic value, similar to that of the neutral sulphate of 8-hydroxyquinoline (sunoxol). 5-sulpho-6-methyl hydroxyquinoline has little antiseptic action.

IV. 0·04% of diacetyl inhibits the growth of many bacteria and is bactericidal for some, including streptococcus, *S. typhi* and *S. paratyphi*. As this substance is not eliminated in higher organisms, a possible clinical application is suggested.

V. Pneumococci are very susceptible to the action of certain unsaturated soaps, *e.g.*, sodium oleate, linoleate, linolenate and clupanodonate. The other unsaturated soaps, as well as the hydroxylated and saturated soaps, are less effective in killing the organism. *Streptococcus lactis* is more resistant to the action of soaps than are pneumococci.—J. M. Robson.

Hudec, I. (1935). Srovnávacie štúdium o hodnote bežne používaných dezinfekčných prostriedkov vo vodnatom a bielkovitom prostredí. [**Value of Common Disinfectants in Watery and Protein Solutions**].—*Zvěrolék. Rozprawy.* **9.** 163-168 and 169-178. [16 refs.] [German summary].

H. compared the time taken to kill *Pseudomonas pyocanea* in watery and in protein solutions, with the following results :–

Disinfectant.	In a watery solution. Killed *P. pyocanea* in minutes.	In a protein solution. Killed *P. pyocanea* in minutes.
Lye (10% solution with 1% of alcohol)	½	½
Sublimate (0·1%)	½	1
Lysol (1 %)	½	1
Phenol (2%)	½	1
Alcohol (75%)	½	1
" Sublamine " (0·1%)	½–1	2
" Odorite " (1%)	½–1	2
Creolin (2%)	½–1	2
Formaldehyde (2%)	½–1	2
" Odoform " (5%)	5	7·5
" Lysoform " (5%)	7·5	10
Chloramine-Heyden (0·1%)	17·5	not in 17·5
" Chlorseptol " (0·1%)	17·5	" 17·5
Chloramine-Bohumen (0·1%)	17·5	" 17·5
" Carvasept " (0·1%)	not in 20	" 30
" Caporit " (0·1%)	in ½	" 30
Potassium hypermanganate (0·1%)	" ½	" 30

BOES. (1936). La technique moderne de la désinfection. [**Modern Methods of Disinfection**].—*Bull. Off. internat. Epiz.* **12.** 214-240. Discussion pp. 573-588.

NICOLAS, E. (1936). Les techniques modernes de la désinfection. [**Modern Methods of Disinfection**].—*Ibid.* 241-275. Discussion pp. 573-588.

The authors review exhaustively the modern technique of disinfection. B. deals with the practical side of disinfection in veterinary work and makes the following suggestions: – (a) all disinfection, including that of personnel and apparatus and the choice of the methods to be adopted, as well as the selection of the disinfectants, should be entirely under the control of veterinarians; (b) all regulations in connexion with disinfection should be based on scientific tests, adapted in the light of modern research; (c) all disinfectants for all types of bacteria should be thoroughly tested in every country, not only for bactericidal power, but also for chemical composition and stability, and (d) control tests should be carried out periodically.

N. deals at considerable length with the chemical aspect of the disinfectants at present in use and the methods of their employment. He concludes by remarking that so many proprietary disinfectants are placed on the market at present that some officially recognized, standard formula for (as far as possible) a general disinfectant is absolutely necessary, and that all disinfectants of which the qualitative and quantitative compositions are undisclosed should be forbidden.—T. D. YOUNG.

JOSLAND, S. W. (1936). **Effect of Feeding Cobalt to Rats.**—*N.Z. J. Sci. Tech.* **18.** 474-480. 4 figs., 1 table. [15 refs.]

J. describes feeding trials on rats with 1% of cobalt added to their diet. Intense polycythaemia and loss of body weight supervened in seven weeks. There was low storage of Co in the kidney and high storage in the liver and carcasses of the rats.

Similar work is being carried out on sheep.—C. S. M. HOPKIRK.

POISONS AND POISONING.

I. ANON. (1935). **Selenium in Plants and Soils.**—*45th Rep. Wyo. agric. Exp. Sta. 1934-1935.* pp. 15-17.

II. TWOMEY, A. C., & TWOMEY, Sarah J. (1936). **Selenium and Duck Sickness.**—*Science.* **83.** 470-471. [4 refs.]

III. FRANKE, K. W., & TULLY, W. C. (1936). **A New Toxicant Occurring naturally in Certain Samples of Plant Foodstuffs. VII. Low Hatchability Due to Deformities in Chicks Produced from Eggs Obtained from Chickens of Known History.**—*Poult. Sci.* **15.** 316-318. 6 figs., 1 table. [2 refs.] [See also *V. B.* **6.** 617].

IV. HURD-KARRER, Annie M., & KENNEDY, Mary H. (1936). **Inhibiting Effect of Sulphur in Selenized Soil on Toxicity of Wheat to Rats.**—*J. agric. Res.* **52.** 933-942. 4 figs., 2 tables. [14 refs.]

I. This is a short abstract of the publications issued by this station on the toxicity of Se for livestock in Wyoming [*V. B.* **5.** 854 and **7.** 136].

II. The years of highest mortality from duck sickness have coincided with those of highest concentration of Se in vegetation and water. Death was produced in ducks by drinking water containing varying concentrations of Se, the length of time necessary to produce death varying inversely with the concentration. The symptoms produced by Se are very similar to those produced by *Clostridium botulinum* Type C. The authors conclude that Se might be a contributory factor in the disease.

III. It was shown by feeding experiments with hens that the production of monsters in eggs resulted from the feeding of " toxic " (selenium-contaminated) grains. The degree of monstrosity varied in the eggs produced by one hen, showing that there was no individual resistance to the toxicant.

IV. The addition of flowers of sulphur or $CaSO_4$ at the rate of 1,500 lb. of S per acre to soil containing 2 parts per million of Se reduced the Se content of wheat grain grown on such soil from 12 to about 4 p.p.m.

Feeding trials with grain grown on treated and untreated soils were carried out with rats and it is claimed that a necrotic condition of the liver was produced by grain grown on untreated soil, while that grown on treated soil appeared to be harmless. As, however, only one rat was used to test each sample of grain the results cannot be regarded as significant.—G. D. SHEARER.

BARDELLI, P., & MENZANI, C. (1935). Sur la fluorose des ruminants. [**Fluorine Poisoning in Ruminants**].—*Ann. Igiene (sper.).* **13.** 399-405. [Translation appeared in *Rev. Path. comp.* **36.** 821-828].

Soon after the foundation of an aluminium factory in the Lagarina valley (Italy), vegetation was affected by its emanations and silkworms died. Later, cattle and goats lost condition, gave less milk and became lame. Rabbits and g. pigs, fed with forage from the valley, showed similar symptoms. The fluorine content of samples of the forage was found to be 0·054–0·078 g. per 1,000 g. of forage, as compared with 0·014 g. per 1,000 g. of normal hay. Experiments on previously affected, but healthy, cattle and goats, which were given smaller daily quantities of fluorine than those previously ingested by them in their forage, caused the reproduction of their former symptoms. Healthy control goats (also previously affected with fluorosis), when stabled with the test goats and fed on normal forage, remained sound. B. and M. found, as the result of their experiments, that the symptoms were caused by emanations from the aluminium factory, and they urge the adoption of technical improvements in the process of aluminium manufacture with a view to obviating similar results in future.

CLAWSON, A. B., COUCH, J. F., & BUNYEA, H. (1935). **The Toxicity of Sodium Cyanide and the Efficiency of the Nitrite-Thiosulphate Combination as a Remedy for Poisoned Animals.**—*J. Wash. Acad. Sci.* **25.** 357-361. 4 tables. [6 refs.]

The authors found that the minimum toxic dose of NaCN, when given as a drench to sheep, was 4·15 mg. and that the M.L.D. was 5·22 mg. per kg. body weight. This is somewhat higher than the corresponding doses for KCN [*V. B.* **5.** 759.] and HCN [*V. B.* **6.** 171.] found by the authors. The nitrite-thiosulphate treatment was found to be effective in 57% of the cases tried.—G. D. SHEARER.

DAYUS, C. V. (1936). **Notes on the Arsenical Poisoning of Live-stock.**—*N.Z. J. Agric.* **53.** 282-286. [3 refs.]

A description of arsenical poisoning in livestock.—C. S. M. HOPKIRK.

PHYSIOLOGY.

BENEDICT, F. G. (1936). **The Physiology of the Elephant.** pp. vii + 302. 13 text figs., 8 plates, numerous tables. [Numerous refs.] Washington: Carnegie Institution. [4to].

This work is a link in a chain of researches by the Carnegie Institution on comparative animal physiology, and deals with pure physiology, mainly metabolism, and chiefly with the physiology and metabolism of a large Indian elephant used in experiments, but numbers of circus elephants were also examined for data on general habits etc. The bulk of the book covers biochemical matter.

There is a good bibliography.—J. E.

I. PEARSON, P. B., & CATCHPOLE, H. R. (1934). **The Partition of Calcium and Inorganic Phosphorus in Equine Serum.**—*Proc. Amer. Soc. Anim. Prod.* pp. 84-86. 1 table. [6 refs.] [Abst. from reprint].

II. PEARSON, P. B., & CATCHPOLE, H. R. (1936). **Correlated Studies of the Partition of Calcium and Inorganic Phosphorus in the Blood Sera of Equidae.**—*Amer. J. Physiol.* **115.** 90-93. 1 table. [11 refs.]

III. FERGUSON, J. H. (1936). **The Blood Calcium and the Calcium Factor in Blood Coagulation.**—*Physiol. Rev.* **16.** 640-760. 1 table. [Numerous refs.]

IV. ANON. (1936). **Mineral Metabolism and the Suprarenal Gland.**—*Lancet.* **230.** 1304. [3 refs.]

I. The mean values of the total, diffusible, and non-diffusible fractions of serum Ca and inorganic P are given for a group of 23 normal and 12 hypophosphoraemic horses. The data show that both the non-diffusible Ca and inorganic P fractions are lower in the hypophosphoraemic group than in the normal animals.

P. and C. claim that the evidence supports the theory that about 10% of the total inorganic P of the serum of the normal horse exists combined with Ca in a colloidal form of tertiary Ca phosphate.

II. The total, diffusible, and non-diffusible fractions of serum, Ca and inorganic P were estimated and the results statistically examined in blood from three distinct breeds of horses, *viz* Percherons, Arabians and Shetlands. It was found that the total and diffusible inorganic P was significantly higher in the Shetland group than in the Percheron group. There was no significant correlation or inverse relationship between total Ca and inorganic P, but there were significant correlations between total and diffusible inorganic P and between total and diffusible Ca. It is concluded that from 57% to 60% of the Ca and from 90% to 95% of the inorganic P are normally diffusible.

III. The extensive evidence reviewed supports the conclusion that thrombin is normally the product of the action of ionized Ca on a precursor substance present in the blood plasma, but until there is a more complete elucidation of the physico-chemical aspects of coagulation, it is difficult to say whether the mode of action of Ca is the formation of a definite and stable colloidal combination, such as a colloidal Ca – cephalin protein compound or merely a catalytic process. Nor is it certain whether prothrombin can even be activated by combined Ca when conditions depressing ionization of the Ca prevail. The " decalcifying " anticoagulants appear to act not only by the simple depression of Ca ionization, but also in a more complex manner, involving a splitting off of Ca from its colloidal compounds with the additional possibility that the oxalate, etc. may itself enter into union with the plasma colloids.

IV. It has recently been demonstrated that, after suprarenalectomy in the opossum and marmot, as well as the usual disturbance in carbohydrate metabolism, there is a rise in the serum sodium rather than the fall which occurs in dogs, cats, rats and human beings.

It has also been found that the administration of potassium salts to suprarenalectomized dogs will precipitate a crisis, while a low potassium diet greatly increases the animals' chances of survival.—R. Allcroft.

Ercegovac, D. (1935). Prilozi pitanju normalne kvantitativne i kvalitativne krvne slike kod ovaca. [**The Normal Quantitative and Qualitative Blood Picture of Sheep**].—*Vet. Arhiv.* **6.** 244-264. 11 tables. [18 refs.] [German summary].

This paper is a study of the subject indicated in the title. The original must be consulted for details.—B. Oswald (Skoplje).

Mattick, Elfreida C. V., & Golding, J. (1936). **Relative Value of Raw and Heated Milk in Nutrition.**—*Lancet.* **230.** 1132-1134 and **231.** 702-706. 5 figs., 6 tables, 4 graphs. [3 refs.]

The authors found it possible to rear seven generations of rats on a diet of flour and water biscuit supplemented by raw milk. " Fresh " or " kept " sterilized milk as a supplement did not permit rearing beyond the third and second generations respectively. There was a suggestion of general dietary deficiency throughout the experiment, as the younger rats were anaemic and inferior in weight to ordinary stock rats.

In a second experiment, comparisons were made between raw, pasteurized and sterilized milk as a supplement. Five, three and no generations respectively were weaned, but the condition and weight of rats in the group on raw and pasteurized milk were markedly superior to those in the group on sterilized milk. By the third generation, the group on raw milk were superior to the group on pasteurized milk. In a further experiment, however, no significant difference in weight was found between groups on raw and pasteurized milk.—S. J. Edwards.

I. Huffman, C. F., Duncan, C. W., & Lightfoot, C. C. (1935). **Vitamin D Studies in Cattle. I. The Antirachitic Value of Hay in the Ration of Dairy Cattle.**—*J. Dairy Sci.* **18.** 511-526. 7 tables. [Numerous refs.]

II. Huffman, C. F., & Duncan, C. W. (1935). **Vitamin D Studies in Cattle. II. The Vitamin D Sparing Action of Magnesium in the Ration of Dairy Cattle.**—*Ibid.* 605-620. 3 figs., 6 tables. [16 refs.]

III. Duncan, C. W., & Huffman, C. F. (1936). **Vitamin D Studies in Cattle. III. Influence of Solar Ultraviolet Radiation upon the Blood Chemistry and**

Mineral Metabolism of Dairy Calves.—*Ibid.* **19.** 291-303. 5 tables. [17 refs.]

IV. Bechtel, H. E., Huffman, C. F., Duncan, C. W., & Hoppert, C. A. (1936). **Vitamin D Studies in Cattle. IV. Corn Silage as a Source of Vitamin D for Dairy Cattle.**—*Ibid.* 359-372. 7 tables. [13 refs.]

I. Vitamin D requirements in calves increase with age and size although individual variation is very great. Blood analyses show three distinct conditions in rickets (a) low Ca, normal P ; (b) normal Ca, low P, and (c) low Ca, low P.

II. The addition of $MgCO_3$ to a rachitogenic diet failed to prevent the clinical symptoms of rickets in calves. Bone analysis showed a better Ca and P utilization following Mg feeding and the experiment suggests that the Mg content of dairy feeds may contribute to their antirachitic effect.

III. The progressively decreasing values for plasma Ca and inorganic P precede all external evidence of rickets in calves. This downward trend is arrested and corrected by the exposure of the animals to sunshine. Solar irradiation enables calves to utilize more fully the constituents of the ration.

IV. Corn silage, fed from 7 to 10 g. of dry matter per kg. of body weight daily, was effective in curing and preventing rickets in calves, and was also sufficient for normal growth and reproduction in dairy cows. Corn cut at its usual stage of maturity for silage possesses definite antirachitic properties for dairy cows.—A. E.

TECHNIQUE.

I. Hollborn, K. (1936). Zwei neue Simultanfarbstoffe. (Vereinfachte Karmin-Säuregrün-Elastin-" H "-Farbung und verbesserte Gram-Simultanfärbung). [**Two New Double Stains**].—*Zlb. Bakt. I.* (*Orig.*). **136.** 506-508. 2 figs. on 1 plate. [2 refs.]

II. Schmidt, J. S. (1936). Ueber eine Abänderung der Färbung nach Ziehl. [**Improvements on Ziehl's Staining Method**].—*Ibid.* 505-506.

III. Levenson, S. (1936). Coloration des cils bactériens par un procédé simple. [**A Simple Method of Staining Bacterial Cilia**].—*Ann. Inst. Pasteur.* **56.** 634-643. 4 figs. [1 ref.]

IV. Schmidt, W. (1936). Versuche zur Färbung von Virusarten mit Viktoriablau. [**Staining of Viruses with Victoria Blue**].—*Zlb. Bakt. I.* (*Orig.*). **136.** 260-263. 14 figs. on 1 plate. [6 refs.]

I. The method of using two new compound stains is recorded but their composition is not given.

II. S. devised a fuchsin stain containing glycerin to avoid the relatively rapid drying on the slide that occurs with the Ziehl-Neelsen stain. He gives details of the method used.

III. Details of the preparation of smears for the staining of bacillary flagella are noted. The use of a dilution of a well-grown young culture is advocated.

IV. Herzberg's technique [(1933). *Zlb. Bakt. I.* (*Orig.*). **130.** 183 and 326, and (1934). **131.** 358.] was found to be valuable for staining the elementary bodies of pox, herpes and vesicular stomatitis, but failed to reveal the elementary bodies of the smaller viruses of foot and mouth disease or fowl plague.—E. J. Pullinger.

Knaysi, G. (1935). **A Microscopical Method of Distinguishing Dead from Living Bacterial Cells.**—*J. Bact.* **30.** 193-206. 2 tables. [Numerous refs.]

A measured volume of culture is diluted with 15-20% of nutrient gelatin at 35°C., containing 0·005% of neutral red. The mixture is shaken thoroughly for a few minutes and then a loopful used to fill a Petroff-Hauser counting chamber.

This is then set aside at 10°C. to allow hardening of the gelatin and to slow down possible growth of the organisms. The gelatin checks motility and supplies rigidity. Counting is done with an oil immersion objective. Usually about 50 small squares are counted, an average of one cell per square being equivalent to 20 million cells per c.c.

A cell is considered dead when the cytoplasm proper is tinged, even slightly, with stain. In culture there is a certain number of cells that are not stained and look healthy, but are unable to multiply. These are numerically few. Some cells, in which autolysis is too far gone, look disorganized and have a low refractive index, without showing evidence of staining. Such cells are not numerous and are easy to recognize.

Comparisons were made between the number of viable cells in cultures of *Bact. coli* as obtained microscopically by the above method, and the number of viable cells as given by plating. A close agreement was found between the two when groups, instead of single cells, were taken into consideration.—A. ROBERTSON.

WOLFF, E. K., & AUSTIN, L. D. C. (1935). **Preservation of Pathological Museum Specimens under Tropical Conditions.**—*Ceylon J. Sci.* Sect. D. **3.** 243-247. [Copied *verbatim* from *Trop. Dis. Bull.* **33.** 635. Signed H. H. S.]

Preservation of pathological specimens is a puzzling problem in the tropics, especially when there is a desire to conserve the colours. Kaiserling, Jores, Pick and other fluids all have their drawbacks and at times prove unsatisfactory. The authors have tried to determine what factors are responsible for preservation of the colours of tissues, and found that none of the ingredients of Jores could be omitted. The reaction of the fluid, however, was found to vary, and they prepared a neutral fixative by adding finally sufficient $NaHCO_3$ to produce a fluid with pH 7·0–7·2. The composition was: Sodium sulphate 220 gm., sodium chloride 90 gm., potassium sulphate 10 gm., chloral hydrate (saturated solution) 500 c.c., formalin 2,000 c.c., water 10,000 c.c., and sodium carbonate to neutrality (20–80 gm.). Even this did not remain neutral in the presence of organic matter, and the specimens after a time turned brown, but less if there was plenty of blood. Fresh ox blood was added, therefore, but while retaining the red of the haemoglobin pale tissues (*e.g.* brain) became yellow. Substitution of blood serum, 10 c.c. to every 100 c.c. solution for the ox blood has proved very satisfactory, especially if watch is kept on the reaction and $NaHCO_3$ added when the pH falls below 7·0. It keeps for a long time, and when it is failing can be restored by occasional addition of chloral and formalin. Care must be taken to see that the fixative penetrates well. For mounting, a 3 per cent. NaCl in distilled water proved satisfactory; the crude salt may be used, and a 35 per cent. solution is saturated; this is repeatedly filtered, cleaned with animal charcoal and refiltered. It is kept in this strength as stock and diluted as required. Any tendency to blueness is counteracted by adding a few drops of 2 per cent. potassium bichromate solution. The whole is sealed with "Aquatex," or a compound of asbestos powder, pitch and linseed oil.

The steps are summarized as follows:–

"1. The specimens are carefully prepared and dressed.
"2. They are hardened in neutralized and buffered fixing solution for one to seven days.
"3. They are next washed in running water for three to twenty-four hours.
"4. If necessary they are placed in rectified spirits to improve the colour.
"5. They are passed through several changes of 3 per cent. sodium chloride solution.
"6. They are finally mounted in 3 per cent. sodium chloride solution, thymol-menthol-benzine solution sprinkled on the surface of the mounting fluid and the jar closed air tight with 'Aquatex'".

OKKELS, H. (1936). **Some Observations on the Cytology of Multinucleated Giant Cells. Golgi-Apparatus and Microincineration.**—*Acta path. microbiol. scand.* **13.** 383-393. 8 figs. [4 refs.] [In English].

da Fano's silver impregnation method was used to study the Golgi apparatus of giant cells arising in inflammatory process and, after incinerating paraffin sections in an electric oven, the mineral content of such cells was estimated by examining the ash with an Ultropak illuminator. The Golgi apparatus of the tissue elements appears to vary considerably in size and shape, and in giant cells seems to fractionate and finally to disintegrate. The mineral content varies according to the nature and situation of the cells and, although foreign body giant cells may be rich in inorganic material, in general the ash content is low, often less than that of epithelioid cells.

—NORMAN HOLE.

OFFICIAL AND OTHER REPORTS.

I. LECLAINCHE, E. (1936). Rapport administratif du directeur de l'office pour l'année 1935-1936. [**Report of the Director of the Office international des Epizooties, 1935-1936**].—*Bull. Off. internat. Epiz.* **12.** 487-489.

II. ANON. (1936). Résolutions adoptées dans la 10e session du comité de l'office international des epizooties. [**Resolutions of the 10th Meeting of the Office international des Epizooties**].—*Ibid.* 633-635.

I. Little progress in the standardization of animal disease statistics has been made ; some countries have continued to send useless information.

The Office contributed 20,000 gold francs to four foot and mouth disease research institutes, and 5,000 gold francs to one institute for the study of equine infectious anaemia. Reports of work done will appear in the *Bulletin* of the Office.

Little progress has been made in the international standardization of tuberculin ; synthetic media have been adopted by many makers, but there is still great variation in the nature of the strains of bacilli used.

II. (1). GERM-CARRIERS : the importance of these in disease prophylaxis was emphasized, with a view to the framing of acts and orders.

(2). ANIMAL BRUCELLOSES : the necessity for a reliable and simple diagnostic test is urged. The antigen and titre significance of the agglutination test should be standardized. Allergic diagnosis should be further developed. The study of chemotherapy and vaccination should be continued.

(3). ENDOCORPUSCULAR HAEMATAZOA : a common unified method of diagnosis has not been found possible. Control should be based on the destruction of tick vectors and on the clearing of affected areas and should be completed by premunition and chemotherapy.

(4). DISINFECTION : existing knowledge does not yet envisage a useful standardization scheme. Many cheap and simple preparations are available and may be advantageously used. Commercial preparations are only approved by the Office international des Epizooties if their composition is known and their activity uniform.

(5). TREATMENT OF ANIMAL CARCASSES : the committee of the Office approve the conclusions of the reporters [*V. B.* **7.** 245] and commend the Dutch methods described therein. The committee see that standardization is impossible, and holds that burial is the only practical method. The technique of burial should be improved.—J. E.

LECLAINCHE, E. (1936). La situation sanitaire en 1935. [**The Livestock Disease Situation in Europe in 1935**].—*Bull. Off. internat. Epiz.* **12.** 5-16. Discussion pp. 501-513. 1 table, 2 graphs. [1 ref.]

This is composed from individual reports of members of the Office international des Epizooties from different nations, and gives information on anthrax, tuberculosis, swine erysipelas, glanders, blackleg, dourine, foot and mouth disease, contagious bovine pleuro-pneumonia, swine fever, sheep pox, rabies, septicaemias of swine, etc. The original should be consulted for details.

In discussion on the paper, L. referred to the difficulty of obtaining a general comparative view of animal diseases in various countries. LOPEZ (Spain) reported the existence of an efficacious antiserum against cont. bov. pl.-pneumonia. In reply to questions he explained that cattle cured by the serum have not been set free into the general cattle trade. MARCZEWSKI (Poland) gave details of the control measures for cont. bov. pl-pneumonia, glanders, and F. and M. disease; ALEKSA (Lithuania) described the situation as regards bovine tuberculosis and swine fever, and BISANTI (Italy) discussed the control of F. and M. disease in their respective countries.—J. E.

FIJI. (1936). **Annual Report, Veterinary Division, 1935.** [TURBET, C. R.]—*Annu. Bull. Dep. Agric. Fiji, 1935.* pp. 32-41. 11 tables. 2 appendixes.

The report for 1935 covers much the same material as in former years.

No infectious diseases occurred among imported stock whilst in quarantine, but there were some mild cases of strangles in thoroughbred mares imported from New Zealand. The disease does not persist in Fiji and it is considered that the local conditions of warmth and high humidity are unfavourable to the propagation of strangles.

As a result of the application of the intradermal tuberculin test during the last five years, the milk supply of Suva is almost completely free from tubercle bacilli. Of 23 dairy herds which supply milk to Suva, including 744 cattle under test, 20 herds were entirely free from the disease and three herds had one reactor each. The incidence has fallen in these herds from 18% in 1931 to 0·4% in 1935. The total number of tests performed in 1935 was 1,446 and 5·9% of the reactions were positive; in 1931, 17·25% of 1,200 tests were positive.

The incidence of tuberculosis is high in non-tuberculin-tested dairy herds and in certain coconut plantation herds. It is extremely low in the small herds of Indian agriculturists, and in range cattle.

BOVINE CONTAGIOUS ABORTION is enzootic in the dairying districts. Control by the complete eradication policy appears to be hopeless. The immunization of non-pregnant heifers with live vaccine is being tried and the results are promising.

A much greater incidence of abortion is observed among grade Jersey cows as compared with grade Friesian cows.

MASTITIS in cows is caused by *Staphylococcus aureus*, *Bact. coli*, *Mycobact. tuberculosis* and *Streptococcus mastitidis*. The last mentioned is the least common.

" SCOURS " in calves was common during the year.

A form of POSTERIOR PARALYSIS in pigs, which was due to an ill-balanced Ca : P ratio in their diet, was observed.

FILARIASIS in dogs is now being treated with " fouadin ".

Several outbreaks of INFECTIOUS KERATITIS were observed in cattle.

ST. LUCIA. (1936). **[Report on] the Livestock Industry [for 1935].**—*Rep. Dep. Agric. St. Lucia, 1935.* pp. 12-13.

A review of the livestock industry. An unofficial census gives 650 horses, 8,000 cattle, 6,300 sheep and 8,000 pigs. Some sheep on the Windward coast were lost as a result of stomach worm infestation. The Chief Veterinary Officer, Trinidad, visited St. Lucia and gave advice on animal husbandry and disease control. Proposals for a model dairy farm were made.—J. E.